The Marquis of Stafford.

Drawn & Engraved by Wm. Evans.

Published as the Act directs Nov.r 1.st 1802.

TRANSACTIONS

OF THE

SOCIETY

INSTITUTED AT LONDON,

FOR THE

ENCOURAGEMENT

OF

ARTS, MANUFACTURES, and COMMERCE;

WITH THE

PREMIUMS offered in the YEAR 1802.

VOL. XX.

LONDON:

Printed by W and C. SPILSBURY, Snowhill.

Sold by the REGISTER, at the SOCIETY'S HOUSE, in the ADELPHI; and by Messrs. ROBSON, J. WHITE, BECKET, JOHNSON, CADELL and DAVIES, PAYNE and MACKINLAY, WALTER, RICHARDSON, SEWELL, and TAYLOR.

[Price TEN SHILLINGS and SIX-PENCE.]

M.DCCCII.

WELLCOME
HISTORICAL
MEDICAL
LIBRARY

PREFACE.

THE Society instituted at London, in the year 1753, for the encouragement of Arts, Manufactures, and Commerce, is founded upon principles so liberal and advantageous to the Public, as probably not to be excelled by any similar establishment in Europe.

To encourage merit in every department of Arts, Manufactures, and Commerce, is the professed object of its Members, and to which they especially call the attention of the Public. Their annual list of Premiums shows some particular subjects which they notice: but their views are not bounded by that list, nor is their patronage confined by its catalogue; for other matters, which are likely to prove in any way useful to

mankind, are received for their consideration, and are often liberally rewarded by Bounties.

It should be well remembered, that this Society does not confine its exhibition of valuable Paintings and Models to a few individuals; but, on the contrary, their Rooms and Repositories are open gratuitously to any person, on the recommendation of a Member, from ten till two o'clock daily, Sundays and Wednesdays excepted; and Sketches of the implements are allowed to be taken, for others to be made from them.

The annual Volume of the Society, to which every Member is entitled, contains an account of the principal Improvements or Inventions rewarded each year; but, independent of these, there are many interesting Models in the Society's Repository, of which no description has yet been published.

It may be necessary to remark, that no Patent Machines are admitted to a place

place in their Repository: it is one of the conditions on which the gifts of the Society are conferred, that the inventor accepts the reward and honourable mention of the Society, in full compensation for a patent right: the inventor has, however, full liberty to make and vend his inventions; and it is natural to suppose, that the applications of the Public for such articles will be made to him, in preference to others; and that the sanction of the Society will bring his merits forward to the world, in a manner likely to procure him much future benefit.

Several decisions lately made in the Courts of Justice, show upon what futile grounds many of the Patents stand which have been granted, and that, instead of producing any profit to the Patentee, they have involved him in great expense and trouble; whereas the rewards of this Society are granted free of every expense, and the inventor's

name is recorded and handed down to posterity.

To add their tribute of especial regret and veneration to the public voice, the Society have adorned the present Volume with a Portrait of his Grace the late Francis Duke of Bedford, drawn and engraved, (with the permission of his illustrious successor), by Mr. Evans, from a Bust executed by Mr. Nollekens. His Grace was elected a member of this Society in the year 1797.

The name of this lamented Nobleman, so lately lost to the world, will excite those recollections of his character, talents, and pursuits, which the language of panegyric would but ill express; the value of his efforts, and their influence upon the present state of society, will live in the pages of the historian. It is for us, while the memory of his well-spent life is fresh, and ere, like most human events, it is softened into the general mass by the shades of distance,

to

to endeavour to perpetuate its influence, by holding forth the bright example for the imitation as well as the admiration of others.

Under the List of Premiums offered by the Society for the present Session, will be found several modifications of the former premiums, and introduction of others. Amongst those which are new, may be noticed the *Cultivation of Buck Wheat — Raising Grass Seeds — Raising Water for the Irrigation of Land—Culture of Hemp in certain parts of Scotland—Refining Copper from the Ore—Mineralogical Maps of England, Wales, Ireland, and Scotland—Line Engravings of Landscapes—Modelling in Clay or Plaster—Ornamental Drawings for Architectural Designs—Perspective Drawings of Machines—Discovery of Statuary Marble—Manufacturing Transparent Paper—Preparing British Mill-stones — Preventing Accidents from Horses falling with Two-wheeled Carriages—and Improvement of Turnpike Roads.*

The Premiums offered for the Cultivation of Hemp in Canada, have been modified, on account of much interesting information received from different parts of Canada on the subject. From experiments made on some samples received from thence, it appears the quality is excellent for the purposes of the Navy; that the culture of it in that country is thought to be an object deserving attention by the government of this Empire; that the premiums offered by the Society have excited a spirit of noble emulation amongst the inhabitants of Canada; and that there is good reason to expect the time is approaching, when this Kingdom will be rendered independent of the Northern Powers for so essential an article, of which the average of the last seven years importation has been above thirty thousand tons per annum.

The plan of curtailing the long Certificates, which occupied a considerable

able part of the former Volumes, has been attended to in the present; and the articles offered to the Public will be found interesting and useful. A few explanatory remarks, on the several subjects in the order they occur, may probably not be unimportant.

Under the class of Agriculture, the Gold Medal of the Society was presented to John Hunter, Esq. of Gubbins, in Hertfordshire; a gentleman considerably advanced in years, and who had devoted much of his time to improvements in Agriculture; actuated by public spirit, he had lately made a plantation of forty thousand Oaks, using at the same time this memorable expression, "I have long "employed myself in such agricultural "pursuits as have yielded to me some "advantages; I will now bequeath a le-"gacy, which will be a benefit to my "country." It is with concern we notice the subsequent decease of this worthy character, after he had been highly

gratified

gratified with the attention paid by the Society to his merit.

The observations of the Rev. Richard Yates, F. A. S. on the culture and growth of Oaks, convey information of great importance on the subject; and it is hoped will be considered with much attention.

The extensive plantations of Larch Trees, by John Christian Curwen, Esq. M. P. deserve public approbation; the quick growth of the Larch, and durability of the timber, when in use, entitle it to the particular attention of all persons concerned in plantations. Mr. Curwen has extended the views of the Society, by additional experiments on fattening Cattle with potatoes; and it is hoped that this object will be further pursued.

Henry Vernon, Esq. of Hilton Park, continues, as will be seen from his Paper on Silver Firs, to extend his beautiful plantations.

The

The communications from Mr. F. C. Cherry, of Stoke d'Aubernon, and Mr. Seth Bull, of Ely, give much satisfactory information, on the planting and growth of Osiers. The advantages derived from them by the planters, the great consumption of them by the basket-makers, and employment afforded by them to the industrious poor, make them a desirable object of a more extended encouragement and patronage.

The utility of Elm-timber has been long experienced; and it affords a pleasing reflexion to observe that Charles Gibson, Esq. of Quermore Park, has formed an extensive plantation, on such a plan as to intermix the beauties of foliage with valuable timber-trees.

It having been too frequently observed, by the Committee of Agriculture, that the management of Fallows, upon the careless principle of mere uncultivation, prevailed too generally throughout the kingdom, they have endeavoured,

in

in their premiums, to correct so pernicious a system, by preventing the growth of weeds, and using what are usually termed meliorating crops; the production of a crop of beans, previous to the sowing of wheat, and during that time in which land is frequently allowed to lie idle, shows, in a strong point of view, from the communication of Mr. Robert Brown, of Markle, the utility of the measure, and the necessity of its being more generally attended to.

Of the great assiduity of Thomas Skip Dyot Bucknall, Esq. frequent honourable mention has been made in many preceding Volumes of the Society's Transactions; his curious detail of the Hampton Court Vine, and his communication on the nature of the varieties of engrafted Fruit-trees, in the present Volume, will be found to contain very important information to Orchardists, and explain many points which have been heretofore very imperfectly understood, relative to the

loss

loss of various species of fruits, and will be the means of furnishing orchards with proper kinds for regular production.

Another valuable Paper on the management of Fruit-trees is inserted from William Fairman, Esq.: it is on the subject of engrafting, and entitled, "Extreme Branch Grafting," to distinguish it from that in common use. By Mr. Fairman's method, trees which have been in a vitiated or barren state, have been rendered productive: new grafts having been introduced at the extremity of the branches, the beauty and size of the trees have been preserved; the new grafts have not only become luxuriant, and produced large crops of fruit, but energy and vigour have been by them communicated to the parent stock, and indicated by healthy shoots and branches from every part of the tree.

The

The very great attention paid by Mr. Johnes, of Hafod, to every branch of agricultural improvement, demands particular notice; and have well entitled him to the honorary rewards of the Society. To surmount the difficulty of local prejudice, is almost an Herculean task: we have even been told, that nature, in certain situations, is ungrateful, and that we may court her favours in vain; but Mr. Johnes has shewn the fallacy of this reasoning.

In the Preface to our last Volume, we gave a short sketch of the beautiful scenery created by him at Hafod, and noticed the improvements then taking place in his dairy; he has lately been occupied in collecting together the different breeds of Milch-cows, and ascertaining their comparative merits. He has imported above forty cows from Holland. He has refuted the erroneous notion, that varieties of Cheese could not

be

be produced on the same land. His dairy furnishes him with the kinds so nearly resembling Parmesan, Stilton, Gloucester, Lancashire, Cheshire, &c. and so excellent in quality, as not to be distinguished either in form or taste from those they are intended to imitate.

He has cultivated, upon an extensive scale, wheat, barley, rye, potatoes, and yams; and his crops, have been equal to those of the Southern counties of England. When we consider his exertions, we reflect with pleasure what may be done by individuals for the general service of mankind.

Before our observations are closed under the class of Agriculture, the great additional value made by Mr. Beech in his land, by plantations and drainings, should not pass unnoticed.

Mr. Spencer Cochrane's communication on the culture of wheat sown in the spring, is a further confirmation to

a Paper

a Paper in the last Volume, by Mr. Brown, of Markle, on this subject; but though it appears that good wheat may be produced in the same year from any kind hitherto tried, it may, nevertheless, be important to ascertain what particular species of wheat is most early in its produce, and best adapted for sowing in the spring.

Under the class of Chemistry will be found an account by Mr. Thomas Willis, an ingenious chemist, of his application of the bulbs of the *Hyacinthus non scriptus*, as a substitute in many cases for Gum Arabic or Senegal. When it is considered that these gums have been sold for many years on an average of 9l. per cwt. it is probable this substitute will be a valuable acquisition to the Calico-printers, as the quantity of gum imported in 1801 was upwards of two millions of pounds.

The edulcoration of Fish-oil has been for a long time thought of consequence

to

to this Kingdom; and the establishment of peace renders every object, which can give encouragement to our sailors at this crisis, particularly desirable. In such a view, the Whale Fisheries of this United Empire, and every improvement of the oil when produced, so as to make it answer the purposes of the other foreign oils, is important; the quantity of foreign olive oil imported into Great Britain in the year 1801, being above 1180 tons in weight. Though forty-two years have elapsed since the late Mr. Dossie's paper on the edulcoration of Fish-oil was rewarded by the Society, yet it will be found to contain much information still useful on the subject, and to be equal to other more modern modes for producing similar effects; it will certainly show that the subject was better understood at the time it was written than has been lately supposed.

It is to be observed, that since the establishment of the Royal Academy, the bounties of this Society, in the class of Polite Arts, are chiefly directed to young artists of two descriptions, viz. to those of fortune, whose taste may lead them to become patrons of the Polite Arts, or as a stimulus to others who are likely to become professional artists.

The rewards, therefore, for encouraging rising genius bestowed by the Society under this class, are not usually detailed in the body of the Volume, but may be found in page 386.

The improvements of Great Britain in her Manufactures within a few years, almost surpass belief; and the art of weaving by machinery alone, in a very extensive manner, is likely to be generally adopted, and to render Europe dependent upon this united Empire for manufactures. Every individual manufacturer seems anxious to excel in improve-

provements ; and the Loom invented by Mr. Clulow, and noticed in this Volume, not only possesses the advantage of Weaving Sacks and similar articles without seams, but its construction is such as to show the means of giving firmness and stability to looms and fabrics of every description.

Under the class of Mechanicks, a variety of articles rewarded by the Society, will be here noted in the order they are printed in the Volume.

The Gun-lock, invented by Mr. Webb, is well calculated to prevent the accidents which frequently happen from the eagerness or carelessness of sportsmen.

In the hurry of passing through a hedge, a twig catching the trigger, often fires a common fowling-piece unintentionally ; or a similar gun, left carelessly loaded, is taken up and fired without consideration. In the first instance, the same cause is not likely to produce a similar effect in Mr. Webb's Lock, and

in the second, the compound motion of the finger and thumb required to discharge the piece, though familiar to the sportsman, will not be found out so easily by a novice in the art.

Mr. Knight's improvement for separating stumps of trees, and useless blocks of wood, by means of gunpowder, will furnish the farmer with many a comfortable fire, instead of suffering such logs to remain a nuisance to the land, as has been frequently the case.

The dreadful ravages occasioned by the dry-rot in timber, are too well known to require any comment; and the expense it occasions is enormous.

The Iron Lever invented by Mr. Woart, and which has been found to answer well in practice, is likely to check its mischief, and give security to the building at a very moderate charge. Its simplicity and effect do great credit to this ingenious workman.

The

The existence of Mill-stone Quarries in Great Britain, to answer the purpose of French Burr-stone for grinding corn, and to preclude the necessity of procuring annually 27,000 Burr-stones from France, has, during the last three years, been so clearly ascertained in Carnarvonshire, Montgomeryshire and Scotland, as to render an offer of further premiums in that line unnecessary. Mr. James Brownhill, of Alloa, near Stirling, in Scotland, has lately received from the Society a reward of One Hundred Pounds for his discovery of a Quarry of Stone at Abbey Craig, the mill-stones from which, by numerous certificates, are reported to have produced more flour, of a better quality, and in less time, than has been produced by French burrs from an equal quantity of the same wheat.

In the month of January last, a reward was recommended by a Committee of the Society to Mr. Henry Greathead

for

for his Life-Boat, and their Gold Medal and Fifty Guineas, were adjudged to him immediately afterwards. The subsequent rewards granted to him from Government, also from the Trinity-House, and Merchants at Lloyd's, confirm the opinion of the Society, on the merits of this invention.

The Society have lately voted their Gold Medal to William Hall Timbrel, Esq. for his improvement of Herniary Trusses, and his new-invented Calico Cushion.

In the department of Colonies and Trade, many interesting communications have been made to the Society, during their last Session.

The culture of the Bread-Fruit Tree appears to be generally extended throughout the West-India islands, and likely to be very beneficial. The accounts received from the Honourable Joseph Robley, Governor of Tobago, show an astonishing increase in his plantation,

and

and that his efforts in that line are successfully continued.

From communications received by the Society from other correspondents, it appears, that a dry nourishing food, resembling Tapioca in appearance and quality, may be prepared from it. Some cakes, well flavoured, made from such flour, have been sent to the Society; and specimens of the Bread-Fruit, preserved in various ways, are now in their possession.

The indefatigable exertions of Dr. Anderson, of the Botanical Garden at St. Vincent, have been rewarded by the Gold Medal of the Society: the good effects of that establishment have not only been proved there, but have been extended by him to most of the neighbouring islands, and likewise to Great Britain.

The garden has lately been enriched by many valuable exotics, procured by him from Trinidad and Cayenne, of which

which he has furnished a list to the Society, amongst which, two of the true Nutmeg Trees are very important acquisitions.

It is understood, that the boundaries of the Garden will soon be enlarged by order of Government, and there is no doubt that proportionable advantages will arise from Dr. Anderson's well-known activity.

The Society desire it to be clearly understood, that, as a body, they are not responsible for any opinion or representation of facts, contained in the following Papers: they have allowed the communications to pass in the language and manner of the several persons concerned, without attempting to make embellishments in the style, which might prejudice the subject matter.

Sundry Presents from different Public Bodies and Individuals, have been received by the Society, the particulars of which are inserted in page 393; they take

take the present opportunity of returning their thanks for these favours, and of expressing hopes of their further continuance.

It will be found, that the Rewards of the Society are not confined to England and Wales. In the last Session, a claim of considerable value was conferred on a person in Scotland. The merits of some claims from Ireland, remain yet under consideration. The Dublin Society have favoured this Society with an account of a reward lately given by them to Mr. Alexander Johnstone, for an improvement in the construction of Malt-Kilns. The mutual efforts of both Bodies will, doubtless, contribute much to the general advantage of the United Empire.

During the last Session, the Society lost, by death, that very faithful officer, Mr. George Cockings, their Register, whose honest zeal in the discharge of his duty, during a service of thirty years, entitles his memory to this record of esteem.

The present Session commenced in October last, and will continue till the month of June. Communications upon subjects relative to Arts, Manufactures, and Commerce, will be immediately laid before the Society, on being addressed to their Secretary, Mr. Charles Taylor, at the Society's House in the Adelphi, London; and ample honorary and pecuniary rewards will be gratuitously conferred, for any inventions or improvements which have merit.

The Society will also esteem any other hints or observations, which may tend to promote the objects of their institution.

The great encouragement which this Society has experienced, for a term of nearly fifty years, and the many worthy characters who continue to be elected Members of it, promise to further, in a high degree, the laudable endeavours of this Establishment, and to insure it, for a long series of years, an honourable distinction amongst the most respectable Societies in Europe.

CONTENTS.

	Page
Preface	
Premiums offered in 1802	1
Papers in Agriculture	75
Papers in Chemistry	199
Papers in Mechanicks	241
Papers in Manufactures	343
Paper in Colonies and Trade	355
Rewards bestowed	381
Presents received	393
Catalogue of Models and Machines	400
List of Officers	403
List of Members	407
Index	

PREMIUMS

OFFERED BY THE

SOCIETY

INSTITUTED AT LONDON,

FOR THE ENCOURAGEMENT OF

ARTS, MANUFACTURES,

AND

COMMERCE,

FOR

THE YEAR M.DCCCII.

TO THE PUBLIC.

JOHN STREET, ADELPHI,
LONDON.

THE chief objects of the SOCIETY are to promote the ARTS, MANUFACTURES, and COMMERCE of this Kingdom, by giving Rewards for all such useful Inventions, Discoveries, and Improvements, (though not mentioned in this Book) as tend to that purpose; and, in pursuance of this plan, the SOCIETY have already expended near FIFTY THOUSAND POUNDS, advanced by voluntary Subscriptions of their Members, and Legacies bequeathed.

The manner in which this money has been distributed may be seen by applying to the Secretary or other Officers of the SOCIETY, at their house in the *Adelphi*. The Register of the Premiums and Bounties they have given will shew the very great advantages which the Public have derived from this Institution.

The Meetings of the SOCIETY are held every *Wednesday*, at seven o'clock in the evening, from the fourth *Wednesday* in *October* to the first *Wednesday* in *June*. The several Committees meet on other evenings in the week during the session; and in general cases in the following manner:

Committees of Correspondence and Agriculture, on *Monday*.
Colonies and Trade, and Manufactures, on *Tuesday*.
Mechanicks, on *Thursday*.
Polite Arts, on *Friday*.
Chemistry, on *Saturday*.
Accompts, in the *first Week* of every Month.

In order still farther to promote the laudable views of this SOCIETY, it may be necessary to explain the mode by which its Members continue to be elected.

Each Member has the privilege, at any weekly Meeting of the SOCIETY, of proposing any person who is desirous to become a Member, provided such proposal is signed by three Members of the SOCIETY.

Peers

Peers of the Realm or Lords of Parliament are, on their being proposed, immediately balloted for; and the name, with the addition and place of abode, of every other person proposing to become a Member, is to be delivered to the Secretary, who is to read the same, and properly insert the name in a List, which is to be hung up in the SOCIETY's room until the next Meeting; at which time such person shall be balloted for; and, if two thirds of the Members, then voting, ballot in his favour, he shall be deemed a *perpetual Member*, upon payment of *Twenty Guineas* at one payment; or a *subscribing Member*, upon payment of any sum not less than *Two Guineas* annually.

Every Member is entitled to vote and be concerned in all the transactions of the SOCIETY, and to attend and vote at the several Committees. He has also the privilege of recommending two persons as Auditors, at the weekly Meeting of the SOCIETY; and, by addressing a note to the Housekeeper, of introducing his friends to examine the various Models, Machines, and Productions, in different branches of Arts, Manufactures, and Commerce, for which Rewards have been bestowed; and to inspect the magnificent series of moral and historical Paintings so happily contrived and

completed by JAMES BARRY, Esq. which, with some excellent Busts and Statues, decorate the Great Room. He has likewise the use of a valuable Library; and is entitled to the annual Volume of the SOCIETY's Transactions.

The time appointed for admission to the Paintings or Models, is from ten to two o'clock, *Sundays* and *Wednesdays* excepted.

Premiums in Agriculture.

[*The Public are requested to take notice that the Society abide by the Premiums offered in the 18th volume of their Transactions, for the setting of Acorns, and planting of Timber-Trees, although such Premiums are not here reprinted.*]

Class 1. FOREST-TREES. To the person who shall have inclosed and planted, or set, the greatest number of acres (not less than ten) of land that is incapable of being ploughed, such as the borders of rivers, the sides of precipices, and any land that has too many rocks, or that is not calculated to repay the expence of tillage, owing to the stiffness or poverty of the soil, the surface being too hilly, mountainous, or otherwise unfit for tillage, with the best sorts of Forest-Trees, namely, Oak, Spanish chesnuts, Ash, Elm, Beech, Alder, Willow, Larch, Spruce and Silver Fir, with or without screens of Scotch Fir, adapted to the soil, and intended for timber trees, between the 1st of October, 1801, and the 1st of April, 1802, the GOLD MEDAL.

2. For the second greatest quantity of land, not less than seven acres, the SILVER MEDAL, or TWENTY GUINEAS.

3. For the third greatest quantity of land, not less than five acres, the SILVER MEDAL.

A particular ACCOUNT of the methods used in making and managing the plantations, the nature of the soil, the probable number of each sort of plants, together with

proper CERTIFICATES that they were in a healthy and thriving state two years at least after making the plantation, to be delivered to the Society on or before the first Tuesday in November, 1805.

4, 5, 6. The same premiums are extended one year farther.

CERTIFICATES to be produced on or before the first Tuesday in November, 1806.

7. ASCERTAINING THE BEST METHOD OF RAISING OAKS. To the person who shall ascertain in the best manner, by actual experiments, the comparative merits of the different modes of raising Oaks for timber, either from acorns set on land of the foregoing description properly dug or tilled, from acorns set by the spade or dibble, without digging or tillage, either on a smooth surface, or among bushes, fern, or other cover; or from young plants previously raised in nurseries, and transplanted; regard being had to the expence, growth, and other respective advantages of the several methods; the GOLD MEDAL.

The ACCOUNTS, and proper CERTIFICATES that not less than one acre has been cultivated in each mode, to be produced to the Society on or before the first Tuesday in November, 1802.

8. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be produced on or before the first Tuesday in November, 1803.

9. OSIERS.

9. OSIERS. To the person who shall have planted, between the 1st of October, 1801, and the 1st of May, 1802, the greatest quantity of land, not less than five acres, with those kinds of Willows, commonly known by the names of Osier, Spaniard, New-kind, or French, fit for the purpose of basket-makers, not fewer than twelve thousand plants on each acre; the GOLD MEDAL, or THIRTY GUINEAS.

10. For the second greatest quantity of land, not less than three acres, the SILVER MEDAL, or TEN GUINEAS.

CERTIFICATES of the planting, and that the plants were in a thriving state five months at least after the planting, to be produced to the Society on or before the last Tuesday in November, 1802.

11. The same premiums are extended one year farther.

CERTIFICATES to be produced on or before the last Tuesday in November, 1803.

*** *The Candidates for planting all kinds of trees are to produce certificates that the respective plantations are properly fenced and secured, and particularly to state the condition of the plants at the time of signing such certificates. Any information which the Candidates for the foregoing premiums may choose to communicate, relative to the methods made use of in forming the plantations, or promoting the growth of the several trees, or any other observations that may have occurred on the subject, will be thankfully received.*

12. SECURING

12. SECURING PLANTATIONS OF TIMBER-TREES, AND HEDGE-ROWS. To the person who shall give to the Society the most satisfactory account, founded on experience, of the most effectual and least expensive method of securing young plantations of Timber-trees, and Hedge-rows, from hares and rabbits, as well as sheep and larger cattle, which at the same time shall be least subject to the depredations of wood-stealers; the SILVER MEDAL, or TWENTY GUINEAS.

The ACCOUNTS, and CERTIFICATES of the efficacy of the methods, to be produced to the Society on or before the first Tuesday in November, 1802.

13. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be produced on or before the first Tuesday in November, 1803.

14. PREVENTING THE BLIGHT, OR RAVAGES OF INSECTS, ON FRUIT-TREES AND CULINARY PLANTS. To the person who shall discover to the Society the most effectual method of preventing the Blight, or ravages of Insects, on Fruit-trees and Culinary Plants, superior to any hitherto known or practised, and verified by actual and comparative experiments; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be delivered to the Society on or before the second Tuesday in November, 1802.

15. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be delivered on or before the second Tuesday in November, 1803.

16. REMOVING

16. REMOVING THE ILL EFFECTS OF BLIGHTS, OR INSECTS. To the person who shall discover to the Society the most effectual method of removing the ill effects of Blights, or Insects, on Fruit-trees and Culinary Plants, superior to any hitherto known and practised, and verified by actual and comparative experiments; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the first Tuesday in February, 1803.

17. COMPARATIVE TILLAGE. For the most satisfactory set of experiments, made on not less than eight acres of land, four of which to be trench-ploughed*, and four to be ploughed in the usual manner, in order to ascertain in what cases it may be adviseable to shorten the operations of Tillage, by adopting one trench-ploughing, for the purpose of burying the weeds, instead of the method, now in common use, of ploughing and harrowing the land three or four times, and raking the weeds together, and burning them; the GOLD MEDAL, or FORTY GUINEAS.

It is required that every operation and expense attending each mode of culture be fully and accurately described, and that proper CERTIFICATES of the nature and condition of the land on which the experiments are made, together with a circumstantial account of the appearance of the subsequent crops during their growth; and also of

* It is a common practice among gardeners, when they have a piece of very foul land, to dig it two spits, or about eighteen inches deep, shovelling the weeds to the bottom. This they call trenching.

the

the quantity and weight of the corn and straw under each mode of culture, or, in case of a green crop, the weight of an average sixteen perches, be produced to the Society on or before the first Tuesday in February, 1803.

18. COMPARATIVE CULTURE OF WHEAT, BROAD-CAST, DRILLED, AND DIBBLED. For the best set of experiments made on not less than twelve acres, four of which to be sown broad-cast, four drilled, and four dibbled, the two latter in equidistant rows, in order fully to ascertain which is the most advantageous mode of cultivating Wheat; the GOLD MEDAL, or FORTY GUINEAS.

It is required that every operation and expense of each mode of culture be fully described; and that proper CERTIFICATES of the nature and condition of the land on which the experiments are made, together with an ACCOUNT of the produce of the corn, the weight per bushel, and also of the straw, be produced to the Society on or before the first Tuesday in February, 1803.

19. SPRING WHEAT. To the person who, between the 10th of January and the 10th of April, 1802, shall cultivate the greatest quantity of Wheat, not less than ten acres; the SILVER MEDAL, or TWENTY GUINEAS.

It is required that the time of sowing and reaping be noticed; also a particular ACCOUNT of the species, cultivation, and expense attending it, with proper CERTIFICATES of the nature and condition of the land on which the experiments were made, and the name of the crop, if any, which the same land bore the preceding year; together

together with an ACCOUNT of the produce, the weight per Winchester bushel; and a Sample, not less than a quart; be produced to the Society on or before the second Tuesday in February, 1803.

It is supposed that sowing Wheat early in the spring will not only allow more time to till the land, but less for the growth of weeds; thus rendering the wheat as clean as a barley crop, and exhausting the soil much less than autumnal sowing. It may be seen in the 19th Volume, that the Wheat usually sown in autumn may be put into the ground, with great success, so late as February or March, thus giving time to clear the ground from turnips, or to avoid a bad season.

20. BEANS AND WHEAT. To the person who shall have dibbled or drilled, between the 1st of December, 1801, and the 1st of April, 1802, the greatest quantity of land, not less than ten acres, with Beans, in equidistant rows, and hoed the intervals twice or oftener, and shall have sown the same land with Wheat in the autumn of the year 1802; the SILVER MELAL or TWENTY GUINEAS.

It is required that an account of the sort and quantity of Beans, the time of dibbling or drilling, and of reaping or mowing them, the produce per acre thrashed, the expense of dibbling or drilling, hand or horse hoeing, the distance of the rows, and the quality of the soil, together with CERTIFICATES of the number of acres, and that the land was afterwards actually sown with Wheat, be produced on or before the second Tuesday in March, 1803.

21. BEANS. To the person who, in the year 1801, shall discover and cultivate, either by the drill or dibbling method,

method, on not less than five acres, a species of Horse-Beans or Tick-Beans, that will ripen their seeds before the 21st of August; the SILVER MEDAL or TWENTY GUINEAS.

It is required that a particular ACCOUNT of the Bean, the cultivation, and the expense attending it, with proper CERTIFICATES of the nature and condition of the land on which the experiments are made; together with an ACCOUNT of the produce, the weight per Winchester bushel, and a sample, of not less than a quart; be produced to the Society on or before the first Tuesday in December, 1802.

It is apprehended that if a Bean should be brought into cultivation with the habits of the hotspur, or other early peas, that it would, in a great measure, escape the danger arising from the collier-insect, or other insects, and allow more time for the farmers to till the land for the subsequent crop of Wheat.

The ACCOUNTS and CERTIFICATES to be delivered on or before the first Tuesday in December, 1802.

22. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be delivered on or before the first Tuesday in December, 1803.

23. COMPARATIVE CULTURE OF TURNIPS. For the best set of experiments, made on not less than eight acres of land, four of which to be sown broad-cast, and four drilled, to ascertain whether it is most advantageous to cultivate Turnips by sowing them broad-cast and hand-hoeing them, or by drilling them in equidistant rows, and hand or horse hoeing the intervals; the SILVER MEDAL, or TWENTY GUINEAS.

It is required that every operation and expense of each mode of culture be fully described, and that proper certificates of the nature and condition of the land on which the experiments were made, together with the weight of the Turnips grown, on a fair average sixteen perches of land, under each mode of culture, be produced to the Society on or before the first Tuesday in March, 1803.

The object whith the Society have in view in offering this premium, is experimentally to ascertain the most advantageous method of growing Turnips. To do this in a satisfactory manner, both the drilled and broad-cast crops should have the advantage of the most perfect cultivation; consequently the drilled crops should have the intervals between the rows worked by the horse or hand hoe, or by both these implements; and the rows should be either weeded or hand-hoed, or both weeded and hand-hoed. The broad-cast crop should have every advantage which weeding and hand-hoeing can give it, consistently with leaving the soil a flat surface.

24. The same premium is extended one year farther.

CERTIFICATES to be produced on or before the first Tuesday in March, 1804.

25. PARSNIPS. To the person who, in the year 1802, shall cultivate the greatest quantity of land, not less than five acres, with Parsnips, for the sole purpose of feeding cattle or sheep; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES of the quantity of land so cultivated, with a particular account of the nature of the soil and weight of the produce on sixteen perches, and also of the

the condition of the cattle or sheep fed with the Parsnips, and the advantages resulting from the practice, to be produced to the Society on or before the second day in November, 1803.

26. BUCK WHEAT. To the person who shall cultivate the greatest quantity of land with Buck Wheat, not less than thirty acres; the GOLD MEDAL.

It is required that the time of sowing and reaping be noticed; also a particular account of the species, cultivation, and expense attending it, the manner of reaping it, thrashing it, and housing the grain; with proper CERTIFICATES of the nature and condition of the land on which the experiments were made, and the name of the crop, if any, which the same land bore the preceding year; together with an ACCOUNT of the produce, and a sample of the seed, not less than a quart; be produced to the Society on or before the second Tuesday in January, 1803.

27. For the next greatest quantity, not less than fifteen acres, on similar conditions; the SILVER MEDAL.

Information respecting its application to the feeding of cattle, hogs, and poultry, and other of its uses, is also desired. It is known to be particularly serviceable in furnishing honey to bees.

28. RAISING GRASS SEEDS. To the person who shall raise the greatest quantity of each or any of the following named Grass Seeds, viz. — Meadow Fox-tail (Alopecurus Pratensis), Sweet-scented Vernal Grass (Anthoxanthum Odoratum), Timothy Grass, Meadow Fescue Grass, Smooth-stalked Meadow Grass (Poa Pratensis), Rough-stalked Meadow Grass (Poa Trivialis); the SILVER MEDAL, or TEN GUINEAS. It

It is required that certificates from persons who have viewed them in a proper state, to identify that they are one or other of the seeds above mentioned, indicating clearly the particular species, and noticing the quantity produced of such seeds, free from weeds or mixture of other grasses, together with proper Samples of the seeds, be produced to the Society on or before the first day of February, 1803.

29. The same premium is extended one year farther.

CERTIFICATES to be produced on or before the first day of February, 1804.

30. ROTATION OF CROPS. To the person who shall, between the 10th of August, 1801, and the 10th of September, 1803, cultivate the greatest quantity of Land, not less than forty acres, in the following rotation, viz.—1st, Winter-Tares; 2d, Turnips; and 3d, Wheat; and apply the two former crops, in the best and most farmer-like manner, to the rearing, supporting, and fattening horses, cattle, sheep, or hogs, on the land which produced the crops; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

31. For the next in quantity or merit, on not less than thirty acres; the SILVER MEDAL, or FIFTY GUINEAS.

32. For the next in quantity or merit, on not less than twenty acres; the SILVER MEDAL.

It is required that every operation and expense be fully described; and that satisfactory certificates of the nature and condition of the soil on which the crops have grown,

together with an account of their appearance, the number of horses and cattle, sheep or hogs, fed by the two green crops, and, as near as possible, the improved value of the live stock by the consumption of those crops, and also the quantity of wheat per acre, and its weight per bushel, be produced to the Society on or before the first day of November, 1804.

It is presumed that very great advantages will arise to such agriculturists as shall adopt this rotation of crops on a dry soil. They will be enabled, with the addition of a few acres of turnip-rooted cabbage for spring food, to keep such large flocks of sheep and herds of neat cattle as may secure a sufficient quantity of manure to fertilize their land in the highest degree, and in every situation. It is farther conceived that Wheats which will bear sowing in the spring will be particularly suitable for this premium.

33. The same premium is extended one year farther.

CERTIFICATES to be delivered on or before the first day of November, 1805.

34. PRESERVING TURNIPS. To the person who shall discover to the Society the best and cheapest method of preserving Turnips perfectly sound, and in every respect fit for the purpose of supporting and fattening sheep and neat cattle, during the months of February, March, and April; the GOLD MEDAL, or THIRTY GUINEAS.

It is required that a full and accurate account of the method employed, and the expense attending the process, together with certificates that the produce of four acres at the least have been preserved according to the method described,

scribed, and applied to feeding of sheep and neat cattle; that the whole were drawn out of the ground before the first day of February, in order to clear the greater part of it previous to its being prepared for corn, and to save the soil from being exhausted by the turnips; and also of the weight of an average sixteen perches of the crop; be produced to the Society on or before the first Tuesday in November, 1803.

N. B. It is recommended to those who may be induced to try the necessary experiments for obtaining this and the following four premiums, to consider the method employed for the preservation of Potatoes in ridges (which the growers call pies), and also the propriety of adopting a similar method in cases where they are previously frozen. It is supposed that, in the latter instance, the addition of ice or snow, and the construction of the ridges upon a large scale, may be sufficient to preserve the freezing temperature till the vegetables are wanted for the use of cattle or sheep, at which time they may be thawed by immersion in cold water, and the *rot* which a sudden thaw produces, may be prevented.

35. For the next in quantity and merit, on not less than two acres, the SILVER MEDAL, or FIFTEEN GUINEAS.

36. PRESERVING CABBAGES. To the person who shall discover to the Society the best and cheapest method of preserving drum-headed Cabbages perfectly sound, and in every respect fit for the purpose of supporting and fattening sheep and neat cattle, during the months of February, March, and April; the GOLD MEDAL, or THIRTY GUINEAS.

37. For the next in quantity and merit, on not less than two acres, the SILVER MEDAL, or FIFTEEN GUINEAS.

Conditions the same as for preserving Turnips, Class 34. And the ACCOUNTS to be produced on or before the first Tuesday in November, 1803.

38. PRESERVING CARROTS, PARSNIPS, OR BEETS. To the person who shall discover to the Society the best and cheapest method of preserving Carrots, Parsnips, or Beets, perfectly sound, and in every respect fit for the purpose of supporting horses, and fattening sheep and neat cattle, during the months of February, March, and April; the SILVER MEDAL, or FIFTEEN GUINEAS.

Conditions the same as for preserving Turnips, Class 34. And the ACCOUNTS to be delivered in, on or before the first Tuesday in November, 1803.

39. PRESERVING POTATOES. To the person who shall discover to the Society the best and cheapest method of preserving Potatoes, two or more years, perfectly sound, without vegetating, and in every other respect fit for the purpose of sets and the use of the table, and, consequently, of supporting and fattening cattle; the SILVER MEDAL, or TWENTY GUINEAS.

It is required that a full and accurate ACCOUNT of the method employed, and the expense attending the process, with CERTIFICATES that one hundred bushels at the least have been preserved according to the method described, and that one or more bushels of the same Potatoes have been set, and produced a crop without any apparent diminution

nution of their vegetative power; and also that they have been used at table, with entire satisfaction to the person who eat of them, together with a sample of one bushel, be sent to the Society on or before the first Tuesday in November, 1804.

40. MAKING MEADOW-HAY IN WET WEATHER. To the person who shall discover to the Society the best and cheapest method, superior to any hitherto practised, of making Meadow-Hay in Wet Weather; the GOLD MEDAL, or THIRTY GUINEAS.

A full ACCOUNT of the method employed, and of the expense attending the process, with not less than fifty-six pounds of the hay, and CERTIFICATES that at least the produce of six acres of land has been made according to the method described, and that the whole is of equal quality with the samples, to be produced on or before the first Tuesday in January, 1803.

41. HARVESTING CORN IN WET WEATHER. To the person who shall discover to the Society the best and cheapest method, superior to any hitherto practised, of harvesting Corn in Wet Weather; the GOLD MEDAL, or THIRTY GUINEAS.

A full ACCOUNT of the method employed, and of the expense attending the process, with not less than two sheaves of the corn, and CERTIFICATES that at least the produce of ten acres has been harvested according to the method described, and that the whole is of equal quality with the samples, to be produced on or before the first Tuesday in January, 1803.

42. ASCERTAINING THE COMPONENT PARTS OF ARABLE LAND. To the person who shall produce to the Society the most satisfactory set of experiments, to ascertain the due proportion of the several component parts of rich Arable Land, in one or more Counties in Great Britain, by an accurate analysis of it; and who having made a like analysis of some poor arable land, shall, by comparing the component parts of each, and thereby ascertaining the deficiencies of the poor soil, improve a quantity of it, not less than one acre, by the addition of such parts as the former experiments shall have discovered to be wanting therein, and therefore probably the cause of its sterility; the GOLD MEDAL, or FORTY GUINEAS.

It is required that the manurings, ploughings, and crops, of the improved land, be the same after the improvement as before; and that a minute ACCOUNT of the produce in each state, of the weather, and of the various influencing circumstances, together with the method made use of in analysing the soils, be produced, with proper CERTIFICATES and the chemical results of the analysis, which are to remain the property of the Society, on or before the last Tuesday in November, 1803.

It is expected that a quantity, not less than six pounds, of the rich, of the poor, and of the improved soils, be produced with the certificates.

43. IMPROVING LAND LYING WASTE. For the most satisfactory ACCOUNT of the best method of improving any of the following soils, being land lying waste or uncultivated, viz. Clay, Gravel, Sand, Chalk, Peat-earth, and

and Bog, verified by experiments on not less than fifty acres of land; the GOLD MEDAL, or THIRTY GUINEAS.

44. For the next greatest quantity, not less than thirty acres, the SILVER MEDAL, or TWENTY GUINEAS.

It is required that the land before such improvement be absolutely uncultivated, and in a great measure useless; and that, in its improved state, it be inclosed, cultivated, and divided into closes.

CERTIFICATES of the number of acres, of the quality of the land so improved, with a full ACCOUNT of every operation and expense attending such improvement, the state it is in as to the proportion of grass to arable, and the average value thereof, to be produced on or before the first Tuesday in February, 1803.

45. MANURES. For the most satisfactory set of experiments, to ascertain the comparative advantages of the following Manures, used as top-dressings on grass or corn land, viz. Soot, Coal-ashes, Wood-ashes, Lime, Gypsum, Night-soil, or any other fit article; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

It is required that the above experiments be made between two or more of the above-mentioned manures, and that not less than two acres of land be dressed with each manure.

An ACCOUNT of the nature of the soil, quantity and expense of the manure, and crops, with CERTIFICATES, to be produced on or before the last Tuesday in February, 1803.

46. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be produced on or before the last Tuesday in February, 1804.

47. GAINING LAND FROM THE SEA. To the person who shall produce to the Society an account of the best method, verified by actual experiment, of gaining Land from the Sea, not less than twenty acres, on the coast of Great Britain or Ireland; the GOLD MEDAL.

CERTIFICATES of the quantity of land, and that the experiments were begun after the 1st of January, 1796, to be produced to the Society on or before the first Tuesday in October, 1802.

48. The same premium is extended one year farther.

CERTIFICATES to be produced on or before the first Tuesday in October, 1803.

49. The same premium is extended one year farther.

CERTIFICATES to be produced on or before the first Tuesday in October, 1804.

50. MACHINE FOR DIBBLING WHEAT. To the person who shall invent a Machine, superior to any hitherto known or in use, to answer the purpose of dibbling Wheat, by which the holes for receiving the grain may be made at equal distances and proper depths; the SILVER MEDAL, or TWENTY GUINEAS.

The MACHINE, with CERTIFICATES that at least three acres have been dibbled by it, to be produced to the Society on or before the second Tuesday in January, 1803.

Simplicity

Simplicity and cheapness in the construction will be considered as principal parts of its merit.

51. MACHINE FOR REAPING OR MOWING CORN. For inventing a Machine to answer the purpose of mowing or reaping Wheat, Rye, Barley, Oats, or Beans, by which it may be done more expeditiously and cheaper than by any method now practised, provided it does not shed the corn or pulse more than the methods in common practice, and that it lays the straw in such a manner that it may be easily gathered up for binding; the GOLD MEDAL, or THIRTY GUINEAS.

The MACHINE, with CERTIFICATES that at least three acres have been cut by it, to be produced to the Society on or before the second Tuesday in December, 1802.

Simplicity and cheapness in the construction will be considered as principal parts of its merit.

52. THRASHING-MACHINE. To the person who shall invent a Machine by which Corn of all sorts may be thrashed more expeditiously, effectually, and at a less expense, than by any method now in use; the GOLD MEDAL, or THIRTY GUINEAS.

The MACHINE, or a Model, with proper CERTIFICATES that such a machine has been usefully applied, that at least thirty quarters have been thrashed by it, and of the time employed in the operation, to be produced to the Society on or before the last Tuesday in February, 1803.

53. DESTROYING THE GRUB OF THE COCK-CHAFER. To the person who shall discover to the Society

ciety an effectual method, verified by repeated and satisfactory trials, of destroying the Grub of the Cockchafer, or of preventing or checking the destructive effects which always attend corn, peas, beans, and turnips, when attacked by those insects; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be produced on or before the first Tuesday in January, 1803.

54. DESTROYING WORMS. To the person who shall discover to the Society an effectual method, verified by repeated and satisfactory trials, of destroying Worms, or of preventing the destructive effects they occasion on corn, beans, peas, or other pulse; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be produced to the Society on or before the first Tuesday in January, 1803.

55. DESTROYING THE FLY ON HOPS. To the person who shall discover to the Society an easy and efficacious method of destroying the Fly on Hops, superior to any hitherto known or practised, on not less than four acres of hop-ground; the GOLD MEDAL, or THIRTY GUINEAS.

ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the first Tuesday in February, 1803.

56. CURE OF THE ROT IN SHEEP. To the person who shall discover to the Society the best and most effectual method of curing the Rot in Sheep, verified by repeated

repeated and satisfactory experiments; the GOLD MEDAL, or FIFTY GUINEAS.

It is expected that the Candidates furnish accurate ACCOUNTS of the symptoms and cure of the disease, together with the imputed cause thereof, and the actual or probable means of prevention, which, with proper CERTIFICATES, must be delivered to the Society on or before the first Tuesday in February, 1803.

57. PREVENTING THE ILL EFFECTS OF FLIES ON SHEEP. To the person who shall discover to the Society the most effectual method of protecting Sheep from being disturbed and injured by Flies; the SILVER MEDAL, or TWENTY GUINEAS.

It is required that the method be ascertained by repeated experiments, and that a CERTIFICATE of its efficacy be delivered to the Society on or before the first Tuesday in December, 1802.

58. PROTECTING SHEEP. To the person who, in the year 1802, shall protect the greatest number of Sheep, not fewer than one hundred, by hovels, sheds, or any other means, and give the most satisfactory account, verified by experiment, of the advantages arising from the practice of protecting Sheep from the inclemency of the weather, by hovels, sheds, or any other means; the SILVER MEDAL, or TWENTY GUINEAS.

A particular ACCOUNT of the experiments made, with the advantages arising therefrom, together with the expense, and CERTIFICATES of its utility, to be produced to the Society on or before the first Tuesday in March, 1803.

59. The

59. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be delivered on or before the first Tuesday in March, 1804.

N. B. It is required that the Certificates shall specify the length of time the sheep were so protected, and the manner in which they were maintained during that time; together with the general method of managing them.

60. IMPROVING THE CONDITION OF THE LABOURING POOR, BY ERECTING COTTAGES, AND APPORTIONING LAND. To the person who, in the year 1801, shall erect the greatest number of Cottages for the accommodation of the labouring Poor, and apportion not less than two acres of Land to each Cottage; the GOLD MEDAL.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the first Tuesday in February, 1803.

61. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the first Tuesday in February, 1804.

62. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the first Tuesday in February, 1805.

63. IMPROVING THE CONDITION OF THE LABOURING POOR BY APPORTIONING LAND

TO

TO COTTAGES. To the person who, in the year 1802, shall apportion to the greatest number of Cottages, already built upon his or her estate, any quantity of Land, not less than two acres to each Cottage, for the better accommodation of the respective inhabitants; the GOLD MEDAL.

The ACCOUNTS of the number of Cottages, and of the quantity of Land apportioned to each, to be delivered to the Society, with proper CERTIFICATES, on or before the first Tuesday in February, 1803.

64. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be delivered on or before the first Tuesday in February, 1804.

65. The same premium is extended one year farther.

The ACCOUNTS and CERTIFICATES to be delivered on or before the first Tuesday in February, 1805.

66. RAISING WATER FOR THE IRRIGATION OF LAND. To the person who shall discover to the Society the cheapest and most effectual method of raising Water in quantities sufficient to be beneficially employed for the purposes of irrigating Land, superior to and cheaper than any other method now in use; the GOLD MEDAL, or THIRTY GUINEAS.

A MODEL, on a scale of one inch to a foot, with CERTIFICATES that a machine at large on the same construction has been used, specifying the quantity of water delivered in gallons per hour, and the height to which it was raised,

raised, to be produced to the Society on or before the first of March, 1803.

66*. The same premium is extended one year farther.

CERTIFICATES to be produced on or before the first of March, 1804.

67. CULTURE OF HEMP IN CERTAIN PARTS OF SCOTLAND. The Society for the Encouragement of Arts, Manufactures, and Commerce, wishing to encourage the growth of Hemp for the use of the Navy, in certain parts of Scotland, comprehending the whole county of Argyle, that part of Perthshire situated to the north of the river Tay, and west of the Military Road (see Ainslie's Map of Scotland) leading from Logierait to the county of Inverness, and such other parts of Scotland as lie north of Inverness-shire, offers to the person who shall sow with Hemp, in drills at least eighteen inches asunder, the greatest quantity of land in the above-mentioned district, not less than fifty acres statute measure, in the year 1802, and shall at the proper season cause to be plucked the summer hemp (or male hemp bearing no seed), and continue the winter hemp (or female hemp bearing seed) on the ground until the seed is ripe; the GOLD MEDAL, or FIFTY GUINEAS.

67*. To the person who shall sow with Hemp (in drills at least eighteen inches asunder) the next greatest quantity of land in the same above-mentioned district, not less than twenty-five acres statute measure, in the year 1802, and shall at the proper season cause the same to be plucked

plucked as above mentioned; the SILVER MEDAL, or TWENTY-FIVE GUINEAS.

CERTIFICATES of the number of acres, of the distance of the drills, of the plucking of the hemp, with a general ACCOUNT of the soil, cultivation, and produce, to be delivered to the Society, along with fourteen pounds of the hemp, and two quarts of the seed, on or before the second Tuesday in January, 1803.

Premiums

Premiums for Discoveries and Improvements in Chemistry, Dying, and Mineralogy.

68. PRESERVING SEEDS OF VEGETABLES. For the best method of preserving the Seeds of Plants in a state fit for vegetation a longer time than has hitherto been practised, such method being superior to any known to the Public, and verified by sufficient trial, to be communicated to the Society on or before the first Tuesday in December, 1802; the GOLD MEDAL, or THIRTY GUINEAS.

69. PREVENTING THE DRY-ROT IN TIMBER. To the person who shall discover to the Society the cause of the Dry-Rot in Timber, and disclose a certain method of prevention superior to any hitherto known; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS of the cause, and method of prevention, confirmed by repeated experiments, to be produced to the Society on or before the second Tuesday in December, 1802.

70. PRESERVING SALTED PROVISIONS FROM BECOMING RANCID OR RUSTY. To the person who shall discover to the Society the best, cheapest, and most efficacious method of preserving salted Provisions from growing rancid or rusty; the GOLD MEDAL, or THIRTY GUINEAS.

A full

A full description of the method, with proper CERTIFICATES that it has been found, on repeated trials, to answer the purpose intended, to be produced to the Society on or before the first Tuesday in February, 1803.

71. CLEARING FEATHERS FROM THEIR ANIMAL OIL. To the person who shall discover to the Society the best and most expeditious method, superior to any hitherto practised, of clearing Goose-Feathers from their offensive Animal Oil, for the use of Upholders, in making beds, cushions, &c. the SILVER MEDAL, or TWENTY GUINEAS.

A quantity of such Feathers unstripped and so cleared, not less than forty pounds weight, with a full ACCOUNT of the process, to be produced to the Society on or before the first Tuesday in February, 1803.

72. REFINING WHALE OR SEAL OIL. For disclosing to the Society an effectual method of purifying Whale or Seal Oil from the glutinous matter that incrusts the wicks of lamps and extinguishes the light, though fully supplied with Oil; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the whole of the process be fully and fairly disclosed, in order that satisfactory experiments may be made by the Society, to determine the validity of the claim; and CERTIFICATES that not less than twenty gallons have been purified according to the process delivered in, together with two gallons of the Oil in its unpurified state, and two gallons so refined, be produced to the Society on or before the second Tuesday in February, 1803.

73. MANUFACTURING TALLOW-CANDLES. To the person who shall discover to the Society a method of hardening or otherwise preparing Tallow, so that Candles may be made of it which will burn as clear and with as small a wick as wax candles, without running, and may be afforded at a less expense than any at present made with spermaceti; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES that 112 lb. of such Tallow has been made into Candles, and 12 lb. of the Candles made thereof, to be produced to the Society on or before the second Tuesday in January, 1803.

74. CANDLES FROM RESIN OR OTHER SUBSTANCES. To the person who shall discover to the Society the best method of making Candles of Resin, or any other substance, fit for common use, at a price much inferior to those made of tallow only; the GOLD MEDAL, or THIRTY GUINEAS.

Six pounds at least of the Candles so prepared, with an ACCOUNT of the process, to be delivered to the Society on or before the first Tuesday in December, 1802.

75. METHOD OF SEPARATING SUGAR IN A SOLID FORM FROM TREACLE. To the person who shall discover to the Society the best method of separating Sugar from Treacle in a solid form, at such an expense as will render it advantageous to the public; the GOLD MEDAL, or FIFTY GUINEAS.

A quantity of the Sugar so prepared in a solid form, not less than thirty pounds weight, with an ACCOUNT of the process, and CERTIFICATES that not less than one hundred

hundred weight has been prepared, to be produced to the Society on or before the first Tuesday in February, 1803.

76. PROOF-SPIRIT. To the distiller who, in the year 1802, shall make the greatest quantity, not less than one hundred gallons, of a clean marketable Spirit, from articles not the food of man or cattle, equal in strength or quality to the Proof-Spirit now in use, and at a rate not higher than the Spirit produced from corn or melasses; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

Ten gallons of the Spirit, together with proper CERTIFICATES, and a full ACCOUNT of the expense and mode of making it, to be produced to the Society on or before the first Tuesday in January, 1803.

77. INCREASING STEAM. To the person who shall invent and discover to the Society a method, verified by actual experiments, of increasing the quantity or force of Steam, in Steam-Engines, with less fuel than has hitherto been employed, provided that in general the whole amount of the expenses in using Steam-Engines may be considerably lessened; the GOLD MEDAL, or THIRTY GUINEAS.

To be communicated to the Society on or before the first Tuesday in January, 1803.

78. SUBSTITUTE FOR TAR. To the person who shall invent and discover to the Society the best Substitute for Stockholm Tar, equal in all its properties to the best of that kind, and prepared from materials the produce of Great Britain; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

A quantity of the Substitute, not less than one hundred weight, with CERTIFICATES that at least one ton has been manufactured, and that it can be afforded at a price not exceeding that of the best foreign Tar, together with an ACCOUNT of the process, to be delivered to the Society on or before the first Tuesday in March, 1803.

79. PREPARATION OF TAN. To the person who shall prepare in the most concentrated form, so as to be easily portable, and at a price applicable to the purposes of manufactures, the largest quantity, not less than one hundred weight, of the principle called by the French *Tannin*, which abounds in oak-bark and many other vegetable substances; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES of the above quantity having been prepared, and a SAMPLE of not less than 28 lb. to be produced to the Society on or before the last Tuesday in January, 1803.

80. PREPARATION OF A RED STAIN FOR COTTON CLOTH. To the person who shall communicate to the Society the cheapest and most effectual method of printing or staining Cotton Cloths with a Red Colour, by an immediate application of the colouring-matter to the Cloth, equally beautiful and durable with the Red Colours now generally procured from decoctions of madder; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES that the above process has been advantageously used on ten pieces of Calico, each twenty-one yards or upwards in length; one piece of the Calico so printed,

printed, a quart of the Colour in a liquid state, and a full ACCOUNT of the preparation and application, to be produced to the Society on or before the second Tuesday in January, 1803.

81. PREPARATION OF A GREEN COLOUR FOR PRINTING COTTON CLOTH. To the person who shall communicate to the Society the best and cheapest method of printing with a full Green Colour on Cotton Cloth, by an immediate application of the colouring-matter from a wooden block to the Cloth, equally beautiful and durable as the Colours now formed from the complicated process of the decoction of weld on alumine, and the solutions of indigo by earths or alkaline salts; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES and conditions as for premium 80.

82. SUBSTITUTE FOR THE BASIS OF PAINT. To the person who shall produce to the Society the best Substitute, superior to any hitherto known, for the Basis of Paint, equally proper for the purpose as the White Lead now employed; such Substitute not to be of a noxious quality, and to be afforded at a price not materially higher than that of White Lead; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

A quantity of the Substitute, not less than 50lb. weight, with an ACCOUNT of the process used in preparing it, and CERTIFICATES that at least one hundred weight has been manufactured, to be produced to the Society on or before the first Tuesday in January, 1803.

83. RED PIGMENT. To the person who shall discover to the Society a full and satisfactory process for preparing a Red Pigment, fit for use, in oil or water, equal in tone and brilliancy to the best carmines and lakes now known or in use, and perfectly durable; the GOLD MEDAL, or THIRTY GUINEAS.

One pound weight of such Colour, and a full disclosure of its preparation, to be produced to the Society on or before the first Tuesday in February, 1803.

N. B. It is not required that the Colour should resist the action of fire or chemical applications, but remain unaltered by the common exposure to strong light, damps, and noisome vapours.

84. ULTRAMARINE. To the person who shall prepare an artificial Ultramarine, equal in colour, brilliancy, or durability, to the best prepared from Lapis Lazuli, and which may be afforded at a cheap rate; the GOLD MEDAL, or THIRTY GUINEAS.

The conditions are the same as in the preceding premium for the Red Pigment.

85. ANALYSIS OF BRITISH MINERALS. To the person who shall communicate to the Society the most correct Analysis of any Mineral Production of Great Britain, hitherto either unexamined or not examined with accuracy; the GOLD MEDAL.

The ANALYSIS and sufficient SPECIMENS to be produced to the Society on or before the first Tuesday in January, 1803.

86. PREPARATION OF SULPHURIC ACID FROM SULPHUR, WITHOUT THE USE OF ANY NITRIC SALT. To the person who shall prepare the largest quantity (not less than one ton) of Sulphuric Acid from Sulphur, without any Nitric Salt, of a specific gravity, not inferior to the best sulphuric acid of commerce; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES that not less than the above quantity of such an acid has been prepared, together with a Sample, to be produced to the Society on or before the first Tuesday in January, 1803.

87. PREPARATION OF ANY ALKALINE OR EARTHY NITRATE. To the person who shall prepare, in Great-Britain, the largest quantity, not less than one hundred weight, of any Salt of Nitric Acid, with either earths or alkalis, by a method superior to those hitherto practised; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

CERTIFICATES of the above quantity having been prepared, and a Sample of not less than 28lb. to be produced to the Society on or before the last Tuesday in January, 1803.

88. FINE BAR-IRON. To the person, in Great-Britain, who shall make the greatest quantity of Bar-iron, not less than ten tons, with coak, from coak-pigs, equal in quality to the best Iron imported from Sweden or Russia, and as fit for converting into steel; the GOLD MEDAL, or FIFTY GUINEAS.

SAMPLES, not less than one hundred weight, with CERTIFICATES that the whole quantity is of equal quality,

to be produced to the Society on or before the first Tuesday in January, 1803.

89. PRESERVING IRON FROM RUST. To the person who shall invent and discover to the Society a cheap composition, superior to any now in use, which shall effectually preserve Wrought Iron from Rust, the GOLD MEDAL, or FIFTY GUINEAS.

A full description of the method of preparing the composition, with CERTIFICATES that it has stood at least two years unimpaired, being exposed to the atmosphere during the whole time, to be produced to the Society, with ten pounds weight of the composition, on or before the first Tuesday in January, 1803.

90. REFINING BLOCK-TIN. To the person who shall discover to the Society the best method of purifying or refining Block-Tin, so as to render it fit for the finest purposes to which grain-tin is now applied, and not higher in price; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES that not less than three tons have been refined or purified, with a full detail of the process, and a quantity, not less than one hundred weight, of the Tin so refined, to be produced to the Society on or before the first Tuesday in January, 1803.

91. GLAZING EARTHEN-WARE WITHOUT LEAD. To the person who shall discover to the Society the cheapest, safest, most durable, and most easily fusible composition, for the purpose of glazing the ordinary kinds of Earthen-ware, without any preparation of Lead, and superior to any hitherto in use; the GOLD MEDAL, or THIRTY GUINEAS.

SPECIMENS

SPECIMENS of the Ware so glazed, with proper CERTIFICATES of its having succeeded, and a Sample of the materials made use of, to be produced to the Society on or before the first Tuesday in February, 1803.

92. REFINING COPPER FROM THE ORE. To the person who shall discover to the Society the best method of separating, purifying, and refining Copper from the Ore, so as to render it fit for the finest purposes to which fine Copper is now applied, and by a process superior to any hitherto known or in use, and not higher in price; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES that not less than three tons have been so prepared or refined, and a quantity not less than one hundred weight of the Copper so refined, to be produced to the Society on or before the first Tuesday in February, 1803.

93. MINERALOGICAL MAP OF ENGLAND AND WALES. To the person who shall complete and publish an accurate Mineralogical Map of England and Wales, on a scale of not less than ten miles to an inch, containing an account of the situation of the different Mines therein, and describing the kinds of Minerals thence produced; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES of the accuracy of such Map, together with the Map, to be produced to the Society on or before the first Tuesday in February, 1804.

The Map to remain the property of the Society.

94. MINERALOGICAL MAP OF IRELAND. The same premium is offered for a Mineralogical Map of Ireland, on similar conditions.

95.

95. MINERALOGICAL MAP OF SCOTLAND. The same premium is offered for a Mineralogical Map of Scotland, on similar conditions.

96. NATURAL HISTORY. To the author who shall publish, in the year 1802, the Natural History of any County in England or Wales; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the several natural productions, whether animal, vegetable, or mineral, peculiar to the county, or found therein, be carefully and specifically arranged and described, in order that the Public may be enabled to judge what arts or manufactures are most likely to succeed in such county.

The Work to be delivered to the Society on or before the last Tuesday in January, 1803.

Premiums in Polite Arts.

97. HONORARY PREMIUMS FOR DRAWING, BY NOBILITY. For the best Drawing, of any kind, made with Water-colours, Crayons, Chalk, Black Lead, Pen, Indian Ink, or Bister, by young Gentlemen under the age of twenty-one, sons or grandsons of Peers, or Peeresses in their own right, of Great Britain or Ireland, to be produced on or before the first Tuesday in March, 1803; the HONORARY MEDAL of the Society IN GOLD.

98. The same IN SILVER for the next in merit.

99, 100. The same premiums will be given, on the like conditions, to young Ladies, daughters or granddaughters of Peers, or Peeresses in their own right, of Great Britain or Ireland.

101. HONORARY PREMIUMS FOR DRAWING, BY GENTLEMEN. For the best Drawing, of any kind, made with Water-colours, Crayons, Chalk, Black Lead, Pen, Indian Ink, or Bister, by young Gentlemen, under the age of twenty-one; to be produced on or before the first Tuesday in March, 1803; the GOLD MEDAL.

102. For the next in merit, the SILVER MEDAL.

103, 104. The same premiums will be given for Drawings by young Ladies.

N. B.

N. B. As the foregoing Honorary Premiums are intended only for such of the Nobility and Gentry as may hereafter become Patrons or Patronesses of the Arts; persons professing any branch of the Polite Arts, or any business dependent on the Arts of Design, or the sons or daughters of such persons, will not be admitted Candidates in these Classes.

105. DRAWINGS OF OUTLINES. For the best Outline, after an original group or cast, in plaster, of Human Figures, by persons of either sex, under the age of sixteen, the principal Figure not less than twelve inches; to be produced on or before the third Tuesday in February, 1803; the greater SILVER PALLET.

106. For the next in merit, the lesser SILVER PALLET.

N. B. These Drawings are to be made on Paper, and the original either to be produced to the Society, or to be referred to for their examination.

107. DRAWINGS OF LANDSCAPES. For the best Drawing of a Landscape after nature, by persons of either sex, under twenty-one years of age, to be produced on or before the third Tuesday in February, 1803; the greater SILVER PALLET.

108. For the next in merit, the lesser SILVER PALLET.

Each Candidate must mention, on the front of the Drawing, whence the view was taken; and the Drawings must be made with Chalk, Pen, Indian Ink, Water-colours, or Bister.

109. HISTORICAL DRAWINGS. For the best Historical Drawing, being an original composition, of five or more Human Figures; the height of the principal Figure not less than eight inches; to be made with Crayons, Chalk, Black Lead, Pen, Indian Ink, Water-colours, or Bister, and to be produced on or before the third Tuesday in February, 1803; the GOLD PALLET.

110. For the next in merit, the greater SILVER PALLET.

111. CHINTS PATTERNS FOR CALICO-PRINTERS. For the best original Pattern, in a new taste, of light or dark ground Chints for garment-work, fit for the purposes of Calico-Printers, by persons of either sex; the GOLD MEDAL.

To be produced to the Society on or before the second Tuesday in January, 1803.

The Pattern to which the premium is adjudged to remain the property of the Society.

112. For the next in merit, the SILVER MEDAL, on similar conditions.

113. COPPER-PLATE PATTERNS FOR CALICO-PRINTERS. For the best Pattern, in a new style, fit for the purposes of Calico-Printers, for garment-work; the SILVER MEDAL.

To be produced to the Society on or before the second Tuesday in January, 1803.

The Pattern to which the premium is adjudged to remain the property of the Society.

114. LINE ENGRAVINGS OF LANDSCAPES. For the best Line Engraving of a Landscape, published in the year 1803, the size of the Engraving not less than eighteen inches by fourteen; the GOLD MEDAL.

To be produced to the Society on or before the last Tuesday in January, 1804; and the impression to which the premium is adjudged to remain the property of the Society.

115. For the next in merit, the SILVER MEDAL, on similar conditions.

116. LINE ENGRAVINGS OF HISTORICAL SUBJECTS. For the best Line Engraving published in the year 1802, of an Historical Subject, the size of the Engraving not less than eighteen inches by fourteen; the GOLD MEDAL.

117. For the next in merit, the SILVER MEDAL.

Conditions, &c. the same as in Classes 114 and 115.

118. MODEL IN CLAY OR PLASTER. For the best Model in Clay or Plaster of an Ornamental Design for the purpose of embellishing works of Architecture; the SILVER MEDAL, or TWENTY GUINEAS.

To be produced to the Society on or before the last Tuesday in January, 1803.

The Model not to be less than thirty inches by twelve.

The following Premium (Class 119,) is offered in conformity to the Will of the late John Stock, of Hampstead, Esq.

119. ORNAMENTAL DRAWINGS FOR ARCHITECTURAL DESIGNS. For the best Ornamental Drawing for the purpose of embellishing Architectural Designs, a SILVER MEDALLION, with the following engraved inscription: *The Premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the Will of John Stock, of Hampstead, Esq.*

The Drawing to which the premium is adjudged to remain the property of the Society.

120. For the best Model in Clay or Plaster of a Design for the same purpose, the SILVER MEDAL.

The performances in these two Classes not to be less than thirty inches by twelve, to be made by persons under the age of twenty-one years.

To be produced to the Society on or before the last Tuesday in January, 1803.

121. PERSPECTIVE DRAWINGS OF MACHINES. For the best Perspective Drawing of Machines, by persons under eighteen years of age, the greater SILVER PALLET.

To be produced to the Society on or before the last Tuesday in January, 1803.

122. For the next in merit, the lesser SILVER PALLET, on similar conditions.

123. ENGRAVING ON WOOD, OR METAL BLOCKS. For the best Engraving on Wood, or Metal Blocks,

Blocks, of a subject or Allegorical Decoration for a volume of the Society's Transactions, proper to be prefixed to the Premiums offered by the Society, and capable of being worked with the letter-press; the GOLD MEDAL.

The engraved Wood or Metal Block, and two or more impressions from it, to be produced to the Society on or before the second Tuesday in February, 1803; and the engraved Wood or Metal Block to which the premium is adjudged, to remain the property of the Society.

The Engraving to be of a proper size to form an octavo page in the volume.

124. For the next in merit, the SILVER MEDAL, on similar conditions.

125. STATUARY MARBLE. To the person who shall discover, within Great Britain or Ireland, a Quarry of White Marble fit for the purposes of Statuary, and equal in all respects to those kinds now imported from Italy; the GOLD MEDAL, or ONE HUNDRED POUNDS.

A Block of at least three feet in length, two in heighth, and two in width, with an ACCOUNT of the situation of the Quarry, and CERTIFICATES of its possessing considerable extent, to be produced to the Society on or before the first Tuesday in February, 1803.

N. B. In order to prevent useless expense or trouble to the claimant in forwarding so large a Block, the Society will be ready to examine any smaller specimen of the Marble, and express their opinion of its value to the Candidate, before the Block required by the above premium is produced.

126.

126. BRONZES. For the best Drapery-figure or Group cast in Bronze; if a single figure, not less than twelve inches high; and, if a group, not less than nine inches; and which will require the least additional labour to repair; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

The Cast to be exhibited to the Society before it is begun to be repaired, with the original figure or group, on or before the first Tuesday in February, 1802, together with a full Explanation of the whole process.

Premiums for encouraging and improving Manufactures.

127. MACHINE FOR CARDING SILK. For the best Machine, superior to any now in use, for Carding Waste Silk equally well as by hand; to be produced, together with a Specimen of the carding, on or before the first Tuesday in November, 1802; the SILVER MEDAL, or TWENTY GUINEAS.

128. CLOTH FROM HOP-STALKS, &c. To the person who shall produce to the Society the greatest quantity, not less than thirty yards, of Cloth at least twenty-seven inches wide, made in Great Britain, of Hop-Stalks or Bines, or other raw Vegetable Substances, the produce of Great Britain or Ireland, superior to any hitherto manufactured from such substances, and which can be generally afforded as cheap as Cloth of equal quality and appearance now made from hemp, flax, or cotton, and much finer in quality than any hitherto manufactured in England from Hop-Stalks, &c. the GOLD MEDAL, or THIRTY GUINEAS.

One pound of the Thread of which the Cloth is made, and thirty yards of the Cloth, together with proper CERTIFICATES that the whole is manufactured from Hop-Stalks or Bines, &c. to be produced to the Society on or before the first Tuesday in December, 1802.

N. B. The Society is already in the possession of Cloth made in England from Hop-Stalks or Bines, which may be inspected by application to the Housekeeper.

129.

129. WICKS FOR CANDLES OR LAMPS. To the person who shall discover to the Society a method of manufacturing Hop-Stalks or Bines, or any other cheap material, the growth of Great Britain, so as to render them equally fit for the purpose of supplying the place of Cotton, for Wicks of Candles or Lamps; TWENTY GUINEAS.

SAMPLES, not less than five pounds weight, of the Wicks so prepared, to be produced to the Society, with CERTIFICATES that the whole quantity is equal in quality to the Sample, on or before the second Tuesday in January, 1803.

130. PAPER FROM RAW VEGETABLE SUBSTANCES. To the person, in Great Britain, who shall, between the first of January, 1802, and the first of January, 1803, make the greatest quantity, and of the best quality (not less than ten reams), of good and useful Paper, from Raw Vegetable Substances, the produce of Great Britain or Ireland, of which one hundred weight has not been used in manufacturing Paper previous to January, 1801, superior to any hitherto manufactured from such Substances, and which can be generally afforded as cheap as Paper of equal quality and appearance now made from Rags; TWENTY GUINEAS.

N. B. The object of the Society being to add to the number and quantity of raw materials used in this manufacture, it is their wish to include every useful sort of Paper, and to introduce such natural products as can be easily and cheaply procured in great quantities.

The Society are in possession of two volumes containing a great variety of specimens of Paper made from Raw Ve-

getable Substances, viz.—Nettles, Potatoe-hawlm, Poplar, Hop-bines, &c. which volumes may be inspected by any person, on application to the Housekeeper.

CERTIFICATES of the making such Paper, and one ream of the Paper, to be produced on or before the second Tuesday in January, 1803.

131. TRANSPARENT PAPER. To the person who shall discover to the Society a method of making Paper from the pulp that shall be perfectly transparent, and of a substance and body equal to foolscap, that shall take and bear common writing ink with the same facility and correctness as Writing-paper generally in use; the SILVER MEDAL, or TWENTY GUINEAS.

CERTIFICATES of the making such Paper, an ACCOUNT of the process, and one ream of the Paper, to be produced on or before the second Tuesday in January, 1803.

132. TAKING PORPOISES. To the people in any boat or vessel, who, in the year 1802, shall take the greatest number of Porpoises on the coast of Great Britain, by gun, harpoon, or any other method, not fewer than thirty, for the purpose of extracting oil from them; the GOLD MEDAL, or THIRTY POUNDS.

CERTIFICATES of the number, signed by the persons to whom they have been sold or delivered for the purpose of extracting the oil, to be produced to the Society on or before the last Tuesday in January, 1803.

133. OIL FROM PORPOISES. To the person who shall manufacture the greatest quantity of Oil from Porpoises taken on the coast of Great Britain, in the year 1802, not

less

less than twenty tons; the GOLD MEDAL, or THIRTY POUNDS.

CERTIFICATES of the Oil having been made from Porpoises actually caught on the coast of Great Britain, and two gallons of the Oil as a sample, to be produced to the Society on or before the last Tuesday in February, 1803.

Premiums in Mechanicks.

134. GUNPOWDER-MILLS. To the person who, in the year 1802, shall invent and bring to perfection the most effectual method of so conducting the works of Gunpowder-Mills, in the business of making Gunpowder, as to prevent explosion; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

CERTIFICATES and ACCOUNTS of the method having been put in practice in one or more Gunpowder-Mills in this Kingdom, and that it promises, in the opinion of the best judges concerned in such works, to answer the purpose intended, to be produced to the Society on or before the first Tuesday in February, 1803.

N. B. As an encouragement to persons to turn their thoughts to improvements of this nature, if any should be made on the present method of conducting the business of Gunpowder-making, which fall short of the total prevention of explosion, and they are sent to the Society for the sake of humanity, the papers so sent in will receive due consideration, and such bounty or reward will be bestowed thereon as they appear to merit.

135. TRANSIT-INSTRUMENT. To the person who shall invent and produce to the Society a cheap and portable Transit-Instrument, which may easily be converted into a zenith-sector, capable of being accurately and expeditiously adjusted, for the purpose of finding the latitudes and longitudes of places, and superior to any portable Transit-

Transit-Instrument now in use; the GOLD MEDAL, or FORTY GUINEAS.

To be produced on or before the last Tuesday in January, 1803.

136. TAKING WHALES BY THE GUN-HARPOON. To the person who, in the year 1802, shall strike the greatest number of Whales, not fewer than three, with the Gun-harpoon; TEN GUINEAS.

Proper CERTIFICATES of the striking such Whales, and that they were actually taken in the year 1802, signed by the Master, or by the Mate when the claim is made by the Master, to be produced to the Society on or before the last Tuesday in December, 1802.

137. FAMILY-MILL. To the person who shall invent and produce to the Society the best-constructed Mill for grinding Corn for the use of Private Families, or Parish Poor; the construction to be such as to render the working of the Mill easy and expeditious, and superior to any hitherto in use; the GOLD MEDAL, or THIRTY GUINEAS.

The MILL, and CERTIFICATES of its having been used to good effect, to be produced to the Society on or before the first Tuesday in February, 1803.

N. B. Cheapness and simplicity will be considered as essential parts of its merit; and the Mill, or the Model, to remain with the Society.

138. MACHINE FOR RAISING COALS, ORE, &c. &c. To the person who shall invent a Machine for

raising Coals, Ore, &c. from mines, superior to any hitherto known or in use, and which shall produce the effect at a less expense than those already known or in use; the GOLD MEDAL, or FIFTY GUINEAS.

A MODEL of the Machine, made on a scale of not less than one inch to a foot, with a CERTIFICATE that a Machine at large on the same construction has been advantageously used, to be produced to the Society on or before the second Tuesday in February, 1803.

139. MACHINE FOR RAISING WATER. To the person who shall invent a Machine on a better, cheaper, and more simple construction than any hitherto known or in use, for raising Water out of wells, &c. from a depth of not less than fifty feet; the GOLD MEDAL, or FORTY GUINEAS.

CERTIFICATES of the performance of the Machine, and a MODEL of it, on a scale of not less than one inch to a foot, to be produced to the Society on or before the first Tuesday in February, 1803.

140. MACHINE FOR MAKING BRICKS. To the person who shall invent the best and cheapest Machine for making Bricks, superior to any hitherto known or in use, whereby the labour and expense of making Bricks in the usual mode, by hand, may be greatly diminished; FORTY GUINEAS.

A MODEL, with CERTIFICATES that a Machine at large, on the same construction, has been used to good effect for the purpose of making Bricks, and that at least one hundred thousand statute-bricks have been made therewith,

therewith, to be produced to the Society on or before the first Tuesday in March, 1803.

141. BORING AND BLASTING ROCKS. To the person who shall discover to the Society a more simple, cheap, and expeditious method than any hitherto known or in use, of Boring and Blasting Rocks in Mines, Shafts, Wells, etc.; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES of the method having been practised with success, with a full description thereof, to be delivered to the Society on or before the first Tuesday in January, 1803.

142. HEATING ROOMS FOR THE PURPOSES OF MANUFACTURERS. To the person who shall invent and discover to the Society a method of heating Rooms, superior to any hitherto known or in use, and at a moderate expense, for the purposes of Painters, Japanners, and other Manufacturers, so as to avoid the necessity of iron or copper tunnels going through the Rooms to convey the smoke, whereby the danger from such tunnels may be prevented; the GOLD MEDAL, or FORTY GUINEAS.

A MODEL, or complete Drawing and Description of the method, with CERTIFICATES that it has been successfully practised, to be delivered to the Society on or before the last Tuesday in March, 1803.

143. IMPROVED VENTILATION. To the person who shall invent and produce to the Society a mode of permanently ventilating the apartments in Hospitals, Workhouses, and other crowded places, superior to any now known or used; the GOLD MEDAL, or FIFTY GUINEAS.

A MODEL of the apparatus, and a full ACCOUNT of the means by which the effect has been produced, with proper CERTIFICATES, to be delivered to the Society on or before the last Tuesday in February, 1803.

144. MILL-STONES. To the person who shall, between the first of February, 1802, and the first of February, 1803, prepare and bring into use the greatest number of Mill-Stones, taken from any Quarry in the United Kingdoms, equal in quality to the French Burrs, not less than thirty pairs; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES that the said Mill-Stones were all taken from the same Quarry, with their prices and dimensions, that they are equal to the French Burr, not less than three feet eight inches diameter, and are actually in use, to be produced to the Society on or before the third Tuesday in February, 1803.

145. For the next greatest quantity, not less than twenty-five pairs; the SILVER MEDAL, or FIFTEEN GUINEAS, on similar terms.

146. PREVENTING ACCIDENTS FROM HORSES FALLING WITH TWO-WHEELED CARRIAGES. To the person who shall invent and produce to the Society a method superior to any hitherto known or in use, to prevent Accidents from the falling of Horses with Two-wheel Carriages, especially on steep declivities; the SILVER MEDAL, or FIFTEEN GUINEAS.

A MODEL of the apparatus, and a full ACCOUNT of the means by which the effect has been produced, with proper

proper CERTIFICATES that the same has been used with success, to be delivered to the Society on or before the second Tuesday in January, 1803.

147. CLEARING THE TURNPIKE AND OTHER ROADS IN WINTER FROM MUD, AND IN SUMMER FROM DUST. To the person who shall discover to the Society the most effectual and the cheapest method, verified by experiments, of clearing the Turnpike and other Roads of great resort, in Winter from Mud, and in Summer from Dust, or most effectully preventing the accumulation of either; the GOLD MEDAL, or FIFTY GUINEAS.

148. For the second best Account, the SILVER MEDAL, or TWENTY GUINEAS.

It is required that an accurate ACCOUNT of the method used, and every expense attending it, together with satisfactory CERTIFICATES of its being effectual, be delivered to the Society on or before the first Tuesday in March, 1803.

Premiums

Premiums offered for the Advantage of the British Colonies.

149. NUTMEGS. For the greatest quantity of merchantable Nutmegs, not less than ten pounds weight, being the growth of His Majesty's dominions in the West Indies, or any of the British Settlements on the coast of Africa, or the several islands adjacent thereto, and equal to those imported from the islands of the East Indies; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

Satisfactory CERTIFICATES, from the Governor, or Commander in Chief, of the place of growth, with an ACCOUNT of the number of trees, their age, nearly the quantity of fruit on each tree, and the manner of culture, to be produced to the Society on or before the first Tuesday in December, 1802.

150. CLOVES. For importing into the Port of London, in the year 1802, the greatest quantity of Cloves, not less than twenty pounds weight, being of the growth of some of the islands of the West Indies subject to the Crown of Great Britain, or any of the British Settlements on the coast of Africa, or the several islands adjacent thereto, and equal in goodness to the Cloves brought from the East Indies; the GOLD MEDAL, or FIFTY GUINEAS.

SAMPLES, not less than two pounds weight, with CERTIFICATES that the whole quantity is equal in goodness, together with satisfactory CERTIFICATES, signed by the Governor, or Commander in Chief, of the place of growth,

with

with an ACCOUNT of the number of trees growing on the spot, their age, and the manner of culture, to be produced to the Society on or before the first Tuesday in January, 1803.

151. PLANTATIONS OF BREAD-FRUIT TREES. To the person who shall have raised in any of the islands of the West Indies subject to the Crown of Great Britain, or in any of the British Settlements on the coast of Africa, or the several islands adjacent thereto, between the first of January, 1801, and the first of January, 1802, the greatest number of Bread-Fruit Trees, not fewer than one hundred, and properly fenced and secured the same, in order to supply the Fruit to the inhabitants; the GOLD MEDAL, or THIRTY GUINEAS.

Proper ACCOUNTS and CERTIFICATES, signed by the Governor, or Commander in Chief, of the methods made use of in cultivating the plants and securing the plantation, and that the trees are in a growing and thriving state at the time of signing such Certificates, to be produced to the Society, with SAMPLES of the Fruit, on or before the first Tuesday in January, 1803.

152. KALI FOR BARILLA. To the person who shall have cultivated, in the Bahama-Islands, or any other part of His Majesty's dominions in the West Indies, or any of the British Settlements on the coast of Africa, or the several islands adjacent thereto, in the year 1801, the greatest quantity of land, not less than two acres, with Spanish Kali, fit for the purpose of making Barilla; the GOLD MEDAL, or THIRTY GUINEAS.

153.

153. For the next greatest quantity, not less than one acre; the SILVER MEDAL, or FIFTEEN GUINEAS.

CERTIFICATES, signed by the Governor, or Commander in Chief, for the time being, of the quantity of land so cultivated, and of the state of the plants, at the time of signing such Certificates, to be delivered to the Society, with SAMPLES of the Kali, on or before the second Tuesday in January, 1803.

154. The same premium is extended one year farther.

CERTIFICATES to be produced on or before the second Tuesday in January, 1804.

155. DESTROYING THE INSECT COMMONLY CALLED THE BORER. To the person who shall discover to the Society an effectual method of destroying the Insect commonly called the Borer, which has, of late years, been so destructive to the Sugar-Canes in the West-India islands, the British settlements on the coast of Africa, and the several islands adjacent thereto; the GOLD MEDAL, or FIFTY GUINEAS.

The discovery to be ascertained by satisfactory CERTIFICATES, under the hand and seal of the Governor, or Commander in Chief, for the time being, and of some other respectable persons, inhabitants of the islands, or other place, in which the remedy has been successfully applied; such Certificates to be delivered to the Society on or before the first Tuesday in January, 1803.

156. CULTIVATION OF HEMP IN UPPER AND LOWER CANADA. To the person who shall sow with Hemp

Hemp the greatest quantity of land in the province of Upper Canada, not less than six arpents (each four fifths of a statute acre), in the year 1802, and shall at the proper season cause to be plucked the Summer Hemp (or Male Hemp bearing no seed) and continue the Winter Hemp (or Female Hemp bearing seed) on the ground until the seed is ripe; the GOLD MEDAL, or ONE HUNDRED DOLLARS.

157. To the person who shall sow with Hemp the next greatest quantity of land in the same province of Upper Canada, not less than five arpents, in the year 1802, in the manner above mentioned; the SILVER MEDAL, or EIGHTY DOLLARS.

158. For the next greatest quantity of land, in the same province, and in a similar manner, not less than four arpents; SIXTY DOLLARS.

159. For the next greatest quantity of land, in the same province, and in a similar manner, not less than three arpents; FORTY DOLLARS.

160. For the next greatest quantity of land, in the same province, and in a similar manner, not less than one arpent; TWENTY DOLLARS.

CERTIFICATES of the number of arpents, the method of culture, of the plucking of the Hemp, with a general ACCOUNT whether sown broad-cast or in drills, the expense, soil, cultivation, and produce, to be transmitted to the Society, certified under the hand and seal of the Governor or Lieutenant-Governor, together with 28 lb. of the

the Hemp, and two quarts of the Seed, on or before the first Tuesday in November, 1803.

161, 162, 163, 164, 165. The same premiums are extended one year farther.

CERTIFICATES, etc. as before mentioned, to be transmitted to the Society on or before the last Tuesday in February, 1804.

166 to 176. Premiums exactly similar in all respects to those held out for the province of Upper Canada, are also offered for the province of Lower Canada, and are extended to the same period.

177. IMPORTATION OF HEMP FROM CANADA. To the Master of that vessel which shall bring to this country the greatest quantity of marketable Hemp, not less than one hundred tons, in the year 1803, the produce of Upper or Lower Canada; the GOLD MEDAL.

178. To the Master of that vessel which shall bring the next quantity, not less than fifty tons; the SILVER MEDAL.

CERTIFICATES satisfactory to the Society to be produced by the Master of the vessel on or before the first Tuesday in February, 1804, to testify that such Hemp was grown and prepared in Canada.

Premiums offered for the Advantage of the British Settlements in the East Indies.

179. BHAUGULPORE COTTON. To the person who shall import into the Port of London, in the year 1802, the greatest quantity, not less than one ton, of the Bhaugulpore Cotton, from which cloths are made in imitation of Nankeen, without dying; the GOLD MEDAL.

A quantity of the Cotton, not less than five pounds weight, in the pod, and five pounds carded, to be produced to the Society, with proper CERTIFICATES, signed by the Secretary to the Board of Trade of Bengal or Bombay, on or before the last Tuesday in February, 1803.

180. ANNATTO. To the person who, in the year 1802, shall import into the Port of London, from any part of the British Settlements in the East Indies, the greatest quantity of Annatto, not less than five hundred weight; the GOLD MEDAL.

A quantity of the Annatto, not less than ten pounds weight, to be produced to the Society, with proper CERTIFICATES, signed by the Secretary of the Board of Trade of the respective Settlement, that the Annatto is the produce of such Settlement, on or before the last Tuesday in February, 1803.

181. TRUE COCHINEAL. To the person who, in the year 1802, shall import into the Port of London,

from any part of the British Settlements in the East Indies, the greatest quantity of the true Cochineal, not less than five hundred weight; the GOLD MEDAL.

A quantity of the Cochineal, not less than ten pounds weight, with proper CERTIFICATES, signed by the Secretary of the Board of Trade of the respective Settlement, that the Cochineal is the produce of such Settlement, to be produced to the Society on or before the first Tuesday in February, 1803.

CONDITIONS

CONDITIONS FOR THE POLITE ARTS.

No person who has gained the first Premium in any Class shall be admitted a Candidate in a Class of an inferior age; and no Candidate shall receive more than one Premium in one year; nor shall they who for two successive years have gained the first Premium in one Class, be again admitted as Candidates in that Class.

No person shall be admitted a Candidate in any Class, who has three times obtained the first Premium in that Class.

No more than one performance in any Class shall be received from the same Candidate.

All performances (to which Premiums or Bounties are adjudged) shall remain with the Society till after the public distribution of Rewards in May, when they shall be re-delivered, unless mentioned in the Premiums to the contrary.

No Performance shall be admitted, that has obtained a Premium, Reward, or Gratification from any other Society, Academy, or School, or been offered for that purpose.

All Performances that obtain Premiums in the Polite Arts, must have been begun after the publication of such Premiums, except Line Engravings.

To encourage real merit, and prevent attempts to impose on the Society, by producing Drawings made or retouched by any other person than the Candidate, the Society require a Specimen of the abilities of each successful

Candidate in Classes 97 to 122 inclusive, under the inspection of the Committee of Polite Arts, in every instance where such proof may appear necessary.

All Candidates in the Polite Arts are required to signify, on their Drawings, their age; and whether the Performances are Originals or Copies; and if Copies, whence they were taken.

Society's Office, Adelphi, *June* 1, 1802.

Ordered,

That the several Candidates and Claimants to whom the Society shall adjudge Premiums or Bounties, do attend at the Society's Office in the Adelphi, on the last Tuesday in May, 1803, at Twelve o'Clock at Noon precisely, to receive the same; that Day being appointed by the Society for the Distribution of their Rewards: And before that Time no Premium or Bounty will be delivered, excepting to those who are about to leave the Kingdom.

In Cases where the Society may think fit to admit Excuses for not attending in person, Deputies may be substituted to receive the Rewards, provided such Deputies are either Members of the Society, or the superior Officers thereof.

GENERAL CONDITIONS.

As the great object of the Society in rewarding individuals, is to draw forth and give currency to those Inventions and Improvements which are likely to benefit the Public at large, Candidates are requested to observe, that if the *means*, by which the respective objects are effected, do require an expense or trouble too great for *general purposes*, the Society will not consider itself as bound to give the offered *Reward;* but, though it thus reserves the power of giving in all cases such part only of any Premium as the Performance shall be adjudged to deserve, or of withholding the whole if there be no merit, yet the Candidates may be assured the Society will always judge liberally of their several Claims.

It is required that the matters for which Premiums are offered, be delivered in without names or any intimation to whom they belong; that each particular thing be marked in what manner each Claimant thinks fit, such Claimant sending with it a paper sealed up, having on the outside a corresponding mark, and, on the inside, the Claimant's name and address; and all Candidates are to take notice, that no Claim for a Premium will be attended to, unless the conditions of the Advertisement are fully complied with.

No Papers shall be opened, but such as shall gain Premiums, unless where it appears to the Society absolutely necessary for the determination of the Claim; all the rest shall be returned unopened, with the matters to which they belong, if inquired after by the mark, within

two

two years; after which time, if not demanded, they shall be publicly burnt, unopened, at some meeting of the Society.

All Models of Machines, which obtain Premiums or Bounties, shall be the property of the Society; and, where a Premium or Bounty is given for any Machine, a perfect Model thereof shall be given to the Society.

All the Premiums of this Society are designed for Great Britain and Ireland, unless expressly mentioned to the contrary.

The Claims shall be determined as soon as possible after the delivery of the Specimens.

No person shall receive any Premium, Bounty, or Encouragement from the Society, for any matter for which he has obtained, or purposes to obtain, a patent.

A Candidate for a Premium, or a person applying for a Bounty, being detected in any disingenuous method to impose on the Society, shall forfeit such Bounty, and be deemed incapable of obtaining any for the future.

The Performances which each year obtain Premiums or Bounties are to remain with the Society until after the public distribution of Rewards.

No Member of this Society shall be a Candidate for, or entitled to receive, any Premium, Bounty, or Reward whatsoever, except the Honorary Medal of the Society. The Candidates are, in all cases, expected to furnish a particular Account of the subject of their Claims; and, where Certificates are required to be produced in claim of Premiums, they should be expressed, as nearly as possible, in the words of the respective Advertisements, and be signed by persons who have a positive knowledge of the facts stated.

Where Premiums or Bounties are obtained in consequence of Specimens produced, the Society mean to retain such part of those Specimens as they may judge necessary, making a reasonable allowance for the same.

No Candidates shall be present at any meetings of the Society or Committees, or admitted at the Society's Rooms, after they have delivered in their Claims, until such Claims are adjudged, unless summoned by the Committee.

N. B. The Society farther invite the Communications of Scientific and Practical Men upon any of the subjects for which Premiums are offered, although their experiments may have been conducted upon a smaller scale than the terms of each require, as they may afford ground for more extensive application, and thus materially forward the views of the Society, and contribute to the advantage of the Public. Such communications to be made by letter, addressed to the Society, and directed to Mr. CHARLES TAYLOR, the Secretary, at the Society's Office, in the Adelphi, London.

The Models required by the Society should be upon the scale of one inch to a foot. The Winchester Bushel is the measure referred to for Grain; and as the Acres of different districts vary in extent, it is necessary to observe, that the Society mean Statute Acres, of five and a half yards to the rod or pole, when Acres are mentioned in their list of Premiums; and they request that all communications to them may be made agreeably thereto.

The Society desire that the Papers on different subjects sent to them may be full, clear, explicit, fit for publication, and rather in the form of Essays than of Letters.

Additional Premiums in Mechanicks.

182. CLEANSING CHIMNIES. To the person who shall invent and produce to the Society the most effectual mechanical or other means for Cleansing Chimnies from Soot, and obviating the necessity of Children being employed within the Flues, the GOLD MEDAL.

183 For the next in Merit, the SILVER MEDAL.

The mechanical, or other means, with CERTIFICATES of their having been used with proper effect, to be produced to the Society on or before the first Tuesday in May, 1803.

184, 185. The same premiums are extended one year further.

186. CHIMNIES CLEANSED. To the person who shall, during the year 1803, cleanse, or cause to be cleansed, the greatest number of Chimnies, at least two stories high, not fewer than three hundred, by any mechanical or other process which does not require the employment of Boys within the Flues, the GOLD MEDAL.

CERTIFICATES, signed by not less than two thirds of those housekeepers on whose premises the said means have been employed, and an account of the process, to be produced to the Society on or before the first Tuesday in February, 1804.

187. To the person who shall cleanse, or cause to be cleansed, the next greatest number of Chimnies, not fewer than one hundred and fifty, upon similar conditions to the above, the SILVER MEDAL.

*** To persons inclined to leave a sum of money to this Society, by will, the following form is offered for that purpose:

Item. I give and bequeath to A. B. and C. D. the sum of upon condition and to the intent that they, or one of them, do pay the same to the Collector for the time being of a Society in London, who now call themselves the Society for the Encouragement of Arts, Manufactures, and Commerce; which said sum of I will and desire may be paid out of my personal estate, and applied towards the carrying on the laudable designs of the Society.

By Order of the Society,

CHARLES TAYLOR, Secretary.

PAPERS

IN

AGRICULTURE.

AGRICULTURE.

THE GOLD MEDAL was this Session presented to JOHN HUNTER, Esq. of Gubbins, in Hertfordshire, for having planted 40,000 OAKS. The following Accounts and Certificates were received from him.

SIR,

I PASS so much of my time in the country, and allow myself so little of it for unavoidable occupations in London, that I seldom find leisure to attend at the Society for the Encouragement of Arts, &c. I shall therefore be obliged to you, if you will inform the Society, at any convenient opportunity, that, in the months of November and December last, I planted nearly forty thousand Oaks of the growth of three years, upon a field

a field on my estate, not more than fifteen miles from town, after having made it a most capital fallow, and secured the plants with a mound of earth round each; and, in short, fenced and otherwise secured it from all depredations, in the most safe and secure manner, for the good of posterity. The field contains twenty-seven acres. If the Society should think a work of this sort worthy of any honorary gratuity, I shall be happy to receive it.

I am, SIR,

Your obedient Servant,

JOHN HUNTER.

Gubbins, Herts,
11*th Feb.* 1800.

To the SECRETARY.

THIS

THIS is to certify, that John Hunter, Esq. of Gubbins, in the parish of North Mims, in the county of Herts, did, in the autumn of the year 1799, set out and plant twenty-seven acres of land, part of his estate situated at Gubbins as aforesaid, with 40,000 Oak-Plants, all of which were of the growth of from two to three years previous to their being so planted; and that the method pursued in planting the same was by a good summer-fallow being given to the land; and the same is well fenced.

It is also further certified, that the said plantation was, and continues to be, well and sufficiently fenced and defended from the depredations of cattle, or any thing else that can tend to injure or destroy the same; and that the plants are at present in a healthy and thriving state.

G. STAINFORTH.

Dec. 1, 1801.

The

The SILVER MEDAL of the Society was this Session voted to the Reverend RICHARD YATES, F. A. S. Chaplain to His Majesty's Royal Hospital at Chelsea, for the following OBSERVATIONS on the CULTIVATION and GROWTH of OAK TIMBER.

SIR,

TO expatiate upon the vast importance of increasing the growth of Oak-Timber, seems unnecessary. The national advantages resulting from this source appear to be in general well understood; and yet the cultivation and management of this most useful plant has not hitherto obtained that degree of attention which it most certainly merits.

Entirely to obviate, or even in some measure to remove or lessen, the obstacles that still continue to impede the planting of Oaks, would therefore be rendering an essential service to the nation.

tion. The desire of accomplishing so beneficial a purpose, has induced the judicious and public-spirited Conductors of the Society of Arts to propose a Premium for "ascertaining the best method "of raising Oaks;"—in consequence of which, this Paper is submitted to their candid consideration. And as the statements here made are founded upon a sedulous and active experience of fifty years, it is presumed the *spirit* and *meaning* of the Society's proposal may have been observed, although it has not been possible (in this instance) *literally* to fulfil its terms; at least, the very intention of promoting and forwarding the views of so enlightened and highly useful a Society, may, it is hoped, be accepted as an apology for calling their attention to these observations.

It forms no part of the present design to enter minutely into the various causes that continue to operate in obstructing the cultivation of Oak; as there is one

of peculiar magnitude, the consequences of which are highly detrimental and injurious, and which it is therefore the principal object of this Paper to remove.

An opinion is generally prevalent, that the Oak is particularly slow in its growth, and requires a great number of years before it affords any advantage. This idea too often deters from planting, on account of the very great length of time it is supposed the land must be occupied before any return of valuable produce can be obtained from it, after a considerable expense may have been incurred in forming plantations.

This opinion I consider as entirely founded in error, and to have taken its rise in a great measure from the want of proper management that has hitherto commonly prevailed in the raising of Oaks: and in this Paper I shall endeavour strongly to state, that the Oak may be rendered very rapid in its growth, and that consequently land may be employed

ployed to great advantage in its cultivation, as a very considerable and profitable produce may, in a much shorter time than is generally supposed, be derived from proper parts of an estate thus employed.

Oak-Timber in this country, for the most part, appears in trees of a considerable extent of head, but seldom more than *twenty* or *thirty* feet in stem; and this, in many instances, the growth of a century. Now, by the course of management here proposed, it is conceived that trees, of at least *double this magnitude*, may be obtained in about half that time.

It is not my intention to attempt a proof of this proposition by theoretical deductions, but to appeal for its confirmation to the indubitable test of fact, which, from the event of repeated trials, impresses a conviction, that experience will be found to support and establish it in the most unequivocal manner.

It would be easy to enlarge much on the various qualities of soil, the nature and process of vegetation, and the peculiar properties of the Oak; but as these topics may be found amply and judiciously discussed in many other authors, who have expressly treated on these subjects, I shall decline all such speculations; and, with the hope of being more essentially useful, shall confine myself to a statement as simple and practical as possible.

The Oak, in the progress of its growth, spreads numerous roots near the surface of the ground, and in an horizontal direction: these assist in supporting and preserving the tree in its position, but seem to contribute very little to its increase and magnitude. The Oak appears to derive its chief nutriment and strength from a root that always descends at right angles to the horizon, and is called the tap-root. The first thing, therefore, to be observed is, that upon a judicious

attention

attention to this peculiarity, the planter's success principally depends; and the neglect of this care is the constant source of error and disappointment. In all climates, and upon all soils, to preserve this tap-root from injury, and as much as possible to assist its growth, is a general, and indeed the most essential principle in the cultivation of Oak. With a due regard to this circumstance, the management of a plantation may be resolved into the three following practical directions:

Previously to planting the acorns, *loosen* the earth intended for their reception, by *deep trenching*.

Never transplant, or in any way disturb, the saplings intended for timber.

Keep the plant carefully *pruned*, till arrived at a proper height.

More fully to elucidate the subject, and to prevent the possibility of misapprehension, it may be proper to give a more detailed statement.

In determining on a spot to form a plantation of Oaks for timber, it must always be recollected that the plants are to remain without removal in their first situation: the clearing and fencing may then be attended to as usual; and in the course of the winter, from September to March, the particular spots intended for the reception of acorns, may be prepared for that purpose, by digging a trench about three feet in width, and from three to six feet in depth, according to the closeness and tenacity of the soil. If grass-ground, the first spit should be placed at the bottom of the trench; and if more than one trench be necessary, they should be prepared in the same manner, preserving a distance of ten yards between each, if it be intended to employ the intermediate space in underwood, or for any other purpose.

Having made a careful selection of acorns that are perfectly sound, and in good preservation, they are to be planted about

about the middle of March. Draw a drill in the centre of the trench; two inches in depth, if the soil be heavy and loamy; but three inches in a light and sandy earth. In this place the acorns two inches asunder, and cover them carefully with mould. When the plants appear, they must be weeded by hand in the rows, and the earth of the trench round them cleaned with a hoe, once a month during the summer. In October inspect the rows, and thin them by pulling up every other plant: attention will of course be paid to remove the weak and crooked plants, and leave those that are tallest and straitest. On the second year, the operation of thinning must be repeated, at the same time, and in the same manner; and, should any of the remaining plants have made side-shoots stronger than the general character, they must be smoothly cut off with a sharp knife, close to the leading stem. On the third year, the thinning is again to be

repeated, and the general pruning commenced, by cutting off close to the leading stem all the side-shoots of the first year; thus leaving the branches of two years to form the head of the following year. The removal of every alternate plant must be continued yearly, till the trees are about thirty feet apart, at which distance they may remain for timber. The pruning is to be continued, by removing every year, very smooth and close to the main stem, one year's growth of side branches, till the plants are arrived at a stem of forty, fifty, or sixty feet, and they may then be permitted to run to head without further pruning.

The particular arrangement here recommended may be varied according to any peculiarities of situation, regard being constantly had to the general and most important principle of loosening the ground *very deep* previously to planting the acorns. By this mode of culture, Oaks may be raised in almost any soil; but,

but, where it is possible, a loam or marl is always to be chosen. Oaks thrive much the best in such earth; and, when assisted by *deep trenching* and *judicious pruning*, attain in a few years to an immense size.

Those who have been accustomed to notice the slow growth and stunted appearance of Oak Trees, when denied the assistance of art, and left to themselves in the common way, would observe with astonishment the vigorous and rapid increase of plants under the management now pointed out.

The plants thinned out the first three or four years, though not fit to be depended upon for timber, as transplanting generally injures very materially the future growth, may be replanted in the intermediate spaces between the rows, for the purpose of being afterwards removed; or they may be usefully placed in hedges, or other spare and unoccupied spots of ground. They should be headed down at the time of transplanting, as

this

this operation assists the process of nature, in reproducing or remedying any injury the tap-root may have received from the removal: and, if proper attention be given to loosening the soil for their reception, and pruning them as they advance, in most instances an adequate profit will be derived from the labour bestowed upon them. After a few years, the produce of the timber-plantation will be found very advantageous. The young trees that are to be removed yearly, will always find a ready market for a variety of purposes, unnecessary here to enumerate. In addition to these advantages, if by this treatment of *deep trenching* previous to planting, and *annual careful pruning* during the growth, timber can be produced in about fifty years, of equal quality, and much superior in size, to that which has been above one hundred years growing under improper management, or without the assistance of cultivation;

it

it will doubtless be allowed that a most beneficial, if not absolutely the best possible method of "raising Oaks," is here pointed out and ascertained.

This method of cultivation may perhaps be thought to occasion so much expense in manual labour as to prevent its being generally adopted: it might perhaps be sufficient to observe, that if the work be conducted with judgment and economy, the future produce would afford ample returns for all necessary expenditure: it should also be recollected, that the previous preparation of the ground, and the subsequent pruning of the plants, are both to be performed at that season of the year when a scarcity of work will enable the planter to obtain assistance upon easier terms; with this additional advantage also, of providing employment for the labourer at those times when the general state of agricultural business renders it difficult for him

to

to find maintenance for himself and family without charitable relief.

In 1750, at Ingestrie in Staffordshire, the seat of Lord Chetwynd, some plantations were formed and managed in a great measure according to the principles here stated, and the growth of the plants was so uncommonly rapid, and so extraordinary, that it could not but attract the notice of all concerned in the conduct of them. The attention to the subject, then excited, has been the occasion and ground of all the observations and experiments made from that time to the present, the result of which is given in this paper.

The extensive plantations of the late Lord Denbeigh, at Newnham Paddox, in Warwickshire, are well known and much admired. The whole has been conducted with great judgment. About a square acre has been employed in raising Oaks upon a plan nearly similar

to

to that now proposed, and affords the best and most convincing proof of the superior utility and efficacy of such management. Had the Noble Earl been now living, I should have been enabled to have laid before the Society some more detailed particulars: That, however, is now impossible; this Paper, therefore, in its present state may perhaps be thought not altogether unworthy of notice, as tending to forward the liberal designs of the Society, and contributing to the advantage of the Public, the author conceiving that the best method of raising Oaks is ascertained and stated in it.

Should the Society be in any degree inclined to join in this sentiment, it may perhaps induce them to make some alteration in the terms of their proposal; as, according to the statements made in this Paper, and indeed from what may be seen in every part of the kingdom, in the character and appearance of Oaks growing without cultivation, it seems

ascertained

ascertained, that " acorns set with the " spade or dibble, without digging or " tillage," can never be depended on to form good timber; and even in the most favourable circumstances of this case, the growth will be exceedingly slow and precarious. The same may be said of " young plants, previously raised in " nurseries, and transplanted;" for if the tap-root be cut, broken, or in any degree injured, which in transplanting it is almost impossible to avoid, that plant will seldom become a vigorous and flourishing tree. To form a course of experiments on such a plant as the Oak, is not a very easy matter. To fulfil explicitly the conditions of the Society would require a great length of time, and would be attended with considerable expense, from which future candidates may in a great measure be exonerated. The raising even one acre in the manner here ascertained might be productive of great pecuniary advantage, if the facts and

experience

experience detailed in this Paper are permitted to prove the inutility of the other two methods, and consequently to remove the necessity of employing so much ground upon them, at an expense they will never repay.

Chelsea College, Nov. 4, 1801.

To Mr. Charles Taylor.

The

The GOLD MEDAL, being the Premium offered for planting LARCH-TREES, was this Session adjudged to JOHN CHRISTIAN CURWEN, Esq. of Workington-Hall, in Cumberland; from whom the following Account and Certificates were received, stating that he had planted eighty-four thousand nine hundred Larch-Trees.

DEAR SIR,

ENCLOSED you have Certificates, with proper attestations, concerning my plantations of Larch-Trees. I might have called upon my friend the Bishop of Llandaff to answer for the progress they already make. The growth of the Larch is astonishing upon the highest hills. I wish I could speak with any satisfaction of my Oaks, for which I received the Gold Medal of the Society in 1787. I am again trying the planting acorns, but am very dubious of success.

I am

I am inclined to suspect the rapid rise of the moss decays the stem of the Oaks, and is the means of their failure. I hope to plant two hundred thousand Larch, as many Oaks, and half the number of Ash, this season. Could I have procured Larch-seed, it was my intention to have made an effort to equal Mr. Johnes's claim, but that I must omit. Upon dry hills the Larch will answer a much better end than Oaks. Wherever there was moisture, the acorns however succeeded well, and are in a thriving state: but, upon the whole, I fear the dibbling of acorns in ground which cannot be previously cleaned, will be found to be very uncertain; when it is attempted, it would be wise to go over the ground, and put in fresh acorns for two or three years.

I have been engaged for some time past in feeding my work-horses, and those employed in my collieries, with

potatoes instead of hay. I boil them with steam. I have for the last five weeks consumed 150 stone per day, and to each stone I put four pounds of cut straw. I have reason to hope I shall succeed; and when satisfied of it, the whole process shall be submitted to the public. An acre of hay produces 260 stone, and an acre of potatoes 1400 stone. Supposing the seed to be equal, the gain is immense, and would lead to very important consequences, by encouraging the growth of wheat. The potatoe culture has been hitherto found too expensive to be carried to any very great extent. From the trials I have made, I am inclined to believe the boiling of potatoes would be found to be highly advantageous in fattening cattle.

It requires 300 acres to furnish hay for my work-horses; and, from precarious seasons, I am often subject to great inconveniences; but should potatoes

toes be found to answer, thirty-five acres will be amply sufficient.

I am, with respect,

Your obedient Servant,

J. CURWEN.

Keswick, Dec. 1, 1801.

CHARLES TAYLOR, Esq.

THE following Certificates accompanied Mr. Curwen's claim, viz. From Thomas Hodgson, of Belle-Isle, stating, that at Belle Grange, in the parish of Hawkshead, he had planted for J. C. Curwen, Esq. between October, 1798, and April, 1799, six thousand Larches, and that the same are well secured by stone walls, and are in a most thriving state: From John Sander, of Keswick, stating, that at Belle Grange, near Windermere Lake, he had planted for J. C. Curwen, Esq. between October, 1798,

and April, 1799, sixty-eight thousand Larch Firs, that they are well secured by a stone fence, and are in a very thriving state: From the Reverend Reg. Brathwaite, Minister of Hawkshead, dated 30th November, 1801, confirming both the above statements, and stating, that on a late view of the plantations he has found them in a most thriving condition: From William Unwin and William Turnbull, stating, that at Brathwaite Edge, and Workington, they had planted for J. C. Curwen, Esq. between October, 1798, and April, 1799, ten thousand nine hundred Larches, and that the same are well secured by railed fences, and in a very promising state: And, lastly, from the Reverend Peter How, Minister of Workington, dated 27th November, 1801, mentioning that he has lately seen the above-named planting, and that it appears to be in a highly thriving condition.

The

The GOLD MEDAL, being the Premium offered for planting SILVER FIRS, was this Session adjudged to HENRY VERNON, Esq. of Hilton Park, near Wolverhampton; from whom the following Account and Certificates were received.

SIR,

I DO myself the honour of sending you the Certificates for my claim for planting Silver Firs. The plants now living are something more than six thousand two hundred and forty; and I have the pleasure to add, that the whole of my plantations are in a most flourishing condition.

I remain, with great respect,

Your most humble Servant,

HENRY VERNON.

No. 10, *Lower Wimpole-Street.*

Mr. CHARLES TAYLOR.

THIS is to certify, that, between the 24th of June, 1797, and the 24th of June, 1798, in a mixed plantation of Forest-trees, I planted ten thousand Silver Firs, which my master, Henry Vernon, Esq. had from Scotland, and which, under my care, have been twice transplanted before, in a plantation of many acres, on the left side of the great gates leading into the turnpike-road that passes from Wolverhampton to Cannock; of which number there are now growing 6,240, in a most healthful state, from four to upwards of six feet in height. The ground for these trees was trenched two spade-graft deep, and cast into five feet ridges, which I find, from long practice under my master, for whom I have planted many hundred acres of good land, to succeed for plants of all kinds in the most luxuriant manner.

All Mr. Vernon's plantations are uncommonly well protected by ditches five feet

feet in width and three feet in depth, all cast on the sides of the plantations, with the additional security of posts and double rails of great strength, of oak, and double rows of quick, which being now six feet in height, are, as usual, about to be split, and laid down under the rails, when the plants fling out uncommonly strong new shoots, which, after growing two years, are headed, and then kept about two feet in height above the bank, and form an impenetrable thick hedge.

Given under my hand, this 11th day of December, 1801.

LAWRENCE GRAY,
Gardener to Henry Vernon, Esq.

The above Account was confirmed by the Reverend John Clare, Vicar of Bushbury.

The GOLD MEDAL, or THIRTY GUINEAS, at the option of the Candidate, being the Premium offered for planting OSIERS, Class 6, Vol. 19, was this Session adjudged to Mr. FREDERICK CLIFFORD CHERRY, of New Wood Farm, near Stoke D'Aubernon, in Surrey; from whom the following Accounts and Certificates were received, and who made choice of the pecuniary Reward.

SIR,

I BEG leave to present myself as a Candidate for the Premium offered by the Society for the Encouragement of Arts, etc. to the person who shall have planted the greatest quantity of land with Osiers, as I have planted sixty acres with the various kinds mentioned in the Society's advertisement, and which are in a very flourishing condition. I hope, at some future period, to have the honour

honour of acquainting the Society with the progress of the various kinds, and every particular relative to the same.

I am, SIR,

Your most obedient Servant,

FREDERICK CLIFFORD CHERRY.

Stoke D'Aubernon,
23d Nov. 1801.

Mr. CHARLES TAYLOR.

SIR,

IN compliance with the desire of your laudable Society, I will give all the information in my power respecting the planting of Osiers at New Wood Farm; and happy shall I be, if any thing I can say may be thought to be in any degree interesting.

The soil is a strong clay, resting on a retentive clay subsoil of great depth. It has

has long been in a state of tillage, and is enclosed by flourishing woody hedges. The soil is naturally of a weak nature, has been much impoverished by bad management, and, as arable land, is not worth five shillings per acre.

The greater part of the plantation in the year 1800 consisted of Oats, and received only one ploughing of a mean depth, previous to planting. Nine acres were wheat in 1800, after summer-fallow. Three acres in the same field, with the nine, were sown with grass-seed in the autumn of 1800, and were planted at the same time with the rest, without any preparation whatever, except that of harrowing once in a place. Eight acres, which were last planted, were in various states of tillage; some were a good fallow in 1800; some were sown with grass-seeds in the autumn of that year; and some were very grassy, and had lain all the summer without ploughing. The grassy part, and the part sown with

with grass-seeds, were ploughed once before planting; but the part which was summer-fallow was not ploughed.

The planting was begun on the 9th of February, 1801, and continued till the whole was finished, which was on the 23d of March.

The sets were large cuttings, of about eighteen inches in length, thrust into the ground by hand, leaving from four to six inches of their length above the surface.

They were all planted in rows from twenty-two to thirty inches asunder, and the sets from twelve to twenty-four inches asunder in the rows; but few were planted at the widest distances.

The plants made a more vigorous shoot in spring than they did afterwards; but they are allowed by judges to look uncommonly well. Very few sets have failed, perhaps not above a hundred on an acre, except in the field last planted, where the dead sets are more numerous.

This

This may be owing more to the treatment the sets received, than to the time in which they were planted. They were brought round the North and South Forelands, were put out of the ship into a barge, and from thence into a waggon, and then remained some time before they were planted.

Those plants that succeeded wheat are much the best Osiers; and those planted on the seeds, without ploughing, are much the worst. They are invariably the best where the ground is cleanest; and from this circumstance I am led to think, that summer-fallowing before planting would be judicious management.

A neighbour of mine planted 350 sets in his garden, 341 of which produced Osiers; the rest died. The soil of the garden is clay. They were planted the latter end of March, in rows, thirty inches by twenty-one inches asunder, with beans between the rows. These

341 sets have produced a bundle of Osiers of about thirty-eight inches in circumference; and some of them are upwards of ten feet in length. This, I think, proves that the soil is congenial, and the tillage favourable to the growth of Osiers.

In the plantation already mentioned there are several sorts, but principally those known by the name of the New-kind. However, as I am not intimately acquainted with the varieties, I will not attempt to describe them.

Any farther information that the Society may require, and I have in my power to give, I shall be very happy to communicate.

I am, Sir,
Your obedient Servant,
F. C. Cherry.

New Wood Farm,
Stoke D'Aubernon, Feb. 16, 1802.

Charles Taylor, Esq.

THIS

THIS is to certify, that Frederick Clifford Cherry, of the parish of Stoke D'Aubernon, in the county of Surrey, has, between the 1st of January and the 1st of April, 1801, planted sixty acres of Willows, commonly known by the names of Osiers, New-kind, and Red Willow, with not less than 17,000 on an acre; and that the same are now properly fenced, and in a thriving condition.

WM. ALLEN, Officiating Minister.
RICH. HARWOOD, Churchwarden.

The

The SILVER MEDAL, or TEN GUINEAS, at the option of the Candidate, being the Premium offered for planting OSIERS, Class 7, Vol. 19, was this Session adjudged to Mr. SETH BULL, of Ely, in Cambridgeshire; from whom the following Account and Certificates were received, and who made choice of the pecuniary Reward.

SIR,

ON reading over the list of Premiums offered by the Society for the Encouragement of Arts, etc. for the year 1801, I beg leave to claim the Premium for planting Osiers.

It may not be unnecessary to premise, that, in the year 1800, I purchased a piece of waste land that lies contiguous to the river Ouse, and is liable to be inundated by every flood. I mention this circumstance, because the value of such land is very little indeed for any other

other purpose than planting; and, on account of its situation for moisture, and the accumulation of fresh soil by the winter floods, is the most proper for that purpose. This land, which was more than eight acres, and was dry during the summer of that year, which was very favourable, I prepared by throwing it up into bars, or beds, each being about a pole in width, and raised them more than a foot higher than the natural soil, for the reception of the sets, or plants, in the Spring of 1801; and, in the months of March and April last, I planted each of them at the distance of exactly twenty-one inches, that is, 14,223 per acre. The season was fine for the purpose; and I have the satisfaction to add, that they have grown beyond my most sanguine expectation, the greater part being more than nine feet in height, and proportionably thick. I have spared neither expense nor care to keep them perfectly free from weeds,

and

and well fenced; and almost all of them will be, in the spring, fit to cut for the basket-maker's use, which is, I believe, an unexampled precedent for so large a quantity. The sorts consist of French, New-kind, West-country, Spaniards, and a few Welch, and Osiers, all of the best quality. I have added the most respectable Certificates of the truth of the above statement. One of them is signed by Thomas Page, Esq. who received the Honorary Premium for planting Osiers in 1799; and the other by the Reverend Mr. Mules, Domestic Chaplain to the Bishop of Ely, and Mr. Lutt, junior, who authorise me to declare, that it is the finest piece of wood they ever saw for the first year of planting; and I think I may add, that it is universally allowed to be so by every person who has seen it.

I shall esteem myself very happy, should I be so fortunate as to receive the Society's Premium, the prospect of

which, I can assure you, acted as a stimulus to me in planting so large a quantity.

I am, SIR,

Your most obedient Servant,

SETH BULL.

Ely, Cambridgeshire,
16th Nov. 1801.

CHARLES TAYLOR, Esq.

Two Certificates, viz. one from Thomas Page, Esq. of Ely, and the other from the Reverend Charles Mules and Mr. Lutt, jun. accompanied this Letter, as above mentioned, and confirmed Mr. Bull's statement.

The

The SILVER MEDAL was this Session presented to CHARLES GIBSON, Esq. of Quermore Park, near Lancaster, for planting 6000 Elms; from whom the following Accounts and Certificates were received.

SIR,

I NOW enclose the statement of the plantations of Charles Gibson, Esq. on the subject of whose claim I troubled you early in November.-

I am, SIR,

Your obedient Servant,

CHARLES ARNOLD.

Bedford-Row,
8th Dec. 1801.

CHARLES TAYLOR, Esq.

THIS is to certify, that the under-mentioned number of Trees have been planted on the estate of Charles Gibson, Esq. of Quermore Park, near Lancaster, from the 1st of December, 1798, to the 1st of April, 1799, viz. *Thirty-five thousand Forest-Trees*, two and a half feet in height, and at the distance of from three to four feet; consisting of nearly an equal quantity of Oak, Larch, Beech, Birch, Mountain Ash, Sycamore, Elms, and Firs, and a mixture of Ash, Hornbeams, and Chesnuts. The above are planted upon waste land, properly fenced, principally with a ditch and bank railed, and partly with stone walls, etc. Thirteen thousand five hundred are likewise upon arable land in tillage, and were well manured the year before planting. Twenty-seven thousand Thorn Quicksets were also planted in new fences made within the above-mentioned time, making four hundred and thirty roods

roods of seven yards, at nine plants in one yard.

ADOLPHUS PERRIE, Superintendant.

Quermore Park,
April 7, 1799.

CHARLES GIBSON

N°	
35,000	Trees.
13,500	
48,500	
27,000	Quicks.

On inspecting the books, the number of Trees as above mentioned stand as follows :

Oak	7,500
Larch	7,500
Beech	6,500
Sycamore	7,000
Elms	6,000
Scotch Firs	2,000
Spruce do.	2,000
Common Ash	1,000
Mountain do.	2,000
Birch	5,000
Spanish Chesnuts	500
Horse do.	500
Hornbeams	1,000
	48,500

THE

THE Bishop of Landaff testifies, that he has seen, in January, the plantations of Charles Gibson, and that they are in a most flourishing and thriving state.

R. LANDAFF.

March 16, 1802.

SIR,

I WAS aware that the total number of Trees planted by me between the 1st December, 1798, and the 1st of April, 1799, would fall short of other claimants; but I thought the Society would be glad to know that the desirable object of planting was pursued in this neighbourhood, though upon a small scale. On the receipt of yours of the 6th instant, I applied to the Gentlemen whose Certificate you have to this Letter, to inspect my plantations, in order to ascertain the state of the Elms, which they

found to be in general in a healthy, thriving condition. It is hardly possible to say what the distance is between each Elm, as they are planted promiscuously with seven or eight sorts of Trees, the whole of which are three feet distant from each other; but they were supposed to be about four or five yards distant. With respect to soil, about three thousand, or one half that number, were planted upon a stiffish soil, with a clay bottom, pulverized by two crops of corn previous to planting. The remainder were planted on a light loam, rather rocky, and which never had been, nor ever could be, cultivated to advantage. The holes for the plants were made two feet in diameter, and much pains was taken to break the sods in the uncultivated ground. I gave from 1s. to 1s. 2d. per hundred for making the holes. The plants were four years old when taken out of my nursery, where they had been two years, being purchased two-years-old

old seedlings, and in general about two feet and a half in height. Those upon the clay succeed the best, probably from the ground being in better order. As they were planted for ornament as well as utility, great care has been taken to preserve the fences. I beg leave to observe, that it is my custom to plant thick (being near the sea), and to thin out about the third year, by transplanting; or, when the plants incommode each other, to make one plantation serve as a nursery for another, till they stand at proper distances to remain for timber. By this method, the removed plants carry up their thickness, and the roots of those which remain, being *in part* cut, put out into the filled-up holes the spring following innumerable fibres, and thrive better than before. I must however observe, that when the Trees become large, they must not be transplanted into very exposed situations. This is all the information in my power to give,

and

and I fear you will find it very unimportant.

I have only to add, that, exclusive of the Elms planted between the 1st December, 1798, and 1st April, 1799 (being 6,000), I have planted upon my estate, in other years, about 2,000 more; and have now between four and five thousand in the nursery to go out next season.

I am, SIR,

Your obedient humble Servant,

CHARLES GIBSON.

Mr. CHARLES TAYLOR.

The above Accounts are certified by Edmund Rigby, one of His Majesty's Justices of the Peace for the county of Lancaster, and P. M. Procter, Clerk, M. A. Perpetual Curate of Eaton.

The

The SILVER MEDAL was this Session presented to Mr. ROBERT BROWN, of Markle, near Haddington, in Scotland, for his Culture of BEANS and WHEAT in one year on the same Land; from whom the following Accounts and Certificates were received of his repeated Experiments on this Culture.

SIR,

I TAKE the liberty of transmitting to you an account of eighty-eight and a half acres of land drilled with Beans in the months of February and March, 1798, amongst which a few Peas were mixed, in order to improve the straw as fodder for horses, and for making ropes to tie the crop. The whole of the said land was sown with Wheat in the month of October the same year. I shall shortly state

state the mode of managing the Beans, being ready to give any further information that may be required.

The land was first cross-ploughed during the preceding winter, and about twenty acres were dunged previous to this furrowing being given, and ten acres more in the spring, when the Beans were drilled. The quantity of dung applied to the acre was about twelve cart-loads, each drawn by two horses, the weight of which might be about a ton. The land at seed-time was clean ploughed over, and the drill-barrow followed every third plough, which gave an interval between the rows of twenty-six or twenty-seven inches. The quantity of seed sown was from seventeen to nineteen pecks per acre, as those who managed the drill sometimes from inattention allowed it to sow a degree thicker at one time than another. The kind of Beans sown was the common Horse-

bean,

bean, mixed, as I have already said, with a trifling quantity of Peas; and the average produce per acre of the whole fields sown was nearly thirty-six bushels per acre, the produce being altogether 3,258 bushels, Winchester measure. They were reaped from the first to the middle of September, and the straw was used for supporting the working-horses during the winter months.

It is now proper I should explain my method of cleaning or ploughing the land, when the crop was on the ground, which was effected by a one-horse plough, without any hand-hoe being used. I first harrowed it completely before the Beans appeared above ground, and water-furrowed and griped it. As soon as the Beans would stand the plough, a gentle furrow was given, and women were employed to turn any of the earth from the plants which might have been thrown

thrown upon them. Every succeeding furrow was taken deeper, and the last was used for laying the earth up close to the plants, which I consider as of great importance. They were ploughed four times; and I estimated the whole expense of cleaning them at four shillings per acre, and that of drilling and harrowing at one shilling and fourpence. In no other way can the ground be cleaned at a less expense.

The soil upon which they were sown was a loam of different varieties. I have for many years practised this mode of husbandry for raising Beans, which have uniformly been succeeded by Wheat, and shall be happy to give you any information in my power respecting the culture of them. This year I have 110 acres, all managed in the way described. I inclose two Certificates, one of the measurement, and the other from two farmers of character, that I had such

fields

fields in Beans and Wheat; and am, respectfully,

Your obedient Servant,

ROBERT BROWN.

Markle, near Haddington, Scotland,
28th October, 1799.

Mr. CHARLES TAYLOR.

I, WILLIAM DICKINSON, sworn measurer and land-surveyor at Linton, in the parish of Preston, and county of Haddington, North Britain, do hereby certify, that I have measured the aftermentioned fields, which were last year drilled with Beans, and sown the same year with Wheat, being part of the farms of Markle and West-Fortune, possessed by Robert Brown, Esq. and find the contents of each, in English statute acres, to be as under, viz.

Upon

Upon Markle Farm.

		A.
1.	Long Side - - - - - - -	11.86
2.	Wester Park - - - - - -	7.70
3.	Foreshot - - - - - - -	24.82
4.	Long Inless - - - - - -	11.18
		55.56

Upon West-Fortune Farm.

		A.	
5.	North Crofts - -	24.40	
6.	Dingleton - - -	8.54	
			32.94
		A.	88.50

Amounting in all to eighty-eight and a half acres, English statute measure.

WILLIAM DICKINSON.

SIR,

SIR,

HAVING sown, according to the drill husbandry, four fields, consisting of eighty-nine acres, three roods, and six poles, English statute measure, with Beans, in the months of February and March, 1800, which were succeeded by Wheat sown in the month of October following, I beg leave to claim the Premium offered by the Society of Arts for these branches of husbandry.

The soil upon which these crops were raised was chiefly of that variety generally characterised as heavy loam, though part of it approached to a soft loam; and nearly the whole was incumbent upon a bottom retentive of moisture. Owing to the uncommon wetness of the autumn and winter months, I was prevented from giving the ground more than one ploughing, except one field, consisting of nineteen acres nearly, which was first cross-ploughed, and afterwards

ploughed in length. The remainder was sown with Beans, the intervals between the drills being twenty-seven inches, in the months of February and March, 1800, after one ploughing; and the whole eighty-nine acres were managed afterwards in the following manner:

The ground was completely harrowed before the plants appeared above ground, and ploughed with one horse as early as the Beans were able to stand the operation. This ploughing was repeated about two months afterwards, and so on as often as necessary. The whole was ploughed four times during the summer months, and a part had five ploughings; and a picking of annual weeds by the hand was given to one of the fields. The total expense of drilling, horse-hoeing, and hand-picking, amounted to about five shillings per acre, upon an average.

The kind of Beans sown was the common Horse-bean, mixed with a few Peas, which were the best part of the crop.

crop. The season during the whole of 1800 was remarkably dry, which stunted the crop on the outset. The plants were therefore very short, and the produce when thrashed was only eighteen Winchester bushels per acre; though I am convinced, if a greater portion of Peas had been mixed with the Beans, the return would have been much superior.

The ground, after carrying Beans, was in excellent order; and, without any dung, yielded me a fine crop of Wheat in 1801. The Wheat was sown after one ploughing, in the month of October, 1800.

I am, SIR,

Your obedient Servant,

ROBERT BROWN.

December 1, 1801.

Mr. CHARLES TAYLOR.

SIR,

ENCLOSED are Certificates of the crop of my Bean-fields of 1800, which were sown with Wheat in the October of that year. The Bean-crop was the worst I ever reaped, though, from being attentively cleaned, the ground was in good order for carrying a crop of Wheat the following year. The advantage of this mode of husbandry consists in this, that in the most unfavourable season the ground may be preserved in good order.

I have a fine crop of Beans this year, and I think the produce will be full thirty-six bushels per acre. I had about one hundred and ten acres under that grain, an account of which I shall probably send you next year.

I had only about thirty acres Spring Wheat this crop, last winter being so favourable as to admit a full sowing in October. With this small quantity I

did

did not think it necessary to offer myself as a claimant.

I am, Sir,

Your most obedient,

Robert Brown.

The Certificates alluded to in the above Letter are from Mr. William Dickinson, land-surveyor at Linton, in the parish of Preston, and county of Haddington; Mr. Alexander Dodds, farmer at Newmains; and Mr. Andrew Somerville, farmer at Atholstoneford; and confirm Mr. Brown's statement.

The THANKS of the Society were this Session voted to T. S. DYOT BUCKNALL, Esq. M. P. for the following Communication relative to the HAMPTON-COURT VINE.

SIR,

THE famous Hampton-Court Vine, which I introduced into the 17th Volume of the Transactions of the Society, has this year received much splendour from a new house graciously ordered to be erected by his Majesty; this house being three feet wider, and two feet higher, than the old one. In order, likewise, that the Vine might sustain no injury from the external air, during the time of placing the new covering over it, at my request the old building was not removed until the other was fully completed; which new building was finished, and the glazing is going on, and

and will be placed in its proper station in the spring of 1802.

At present the glass, from the increased width and heighth of the house, is 72 feet by 21 feet; and, by the enlargement of a perpendicular light of 72 feet by 3 feet, makes together 1,728 superficial square feet of glass, placed over one Vine, and filling the whole house.

From the best information I could collect, this Vine was planted in the year 1770; and, from the fortunate station it has acquired, with the attention which is given to all the valuable fruits raised within the royal gardens, Mr. Padley and I entertain no doubt but it may continue in health and full bearing for a great length of time. I have been more minute than otherwise I should, from the wish, that whenever any curious production is observed in the vegetable kingdom, some intelligent person would record it for posterity, in any popular publication of the time. Such attention

would be of very material service in Horticulture, and the habit would gradually remove many doubts which obstruct the progress of improvements.

This Vine was at first selected rather accidentally, for I remember five different Vines within the same building. As it displayed a vigour, and a disposition to fruitfulness beyond the rest, it induced the chief manager to order the others to be cut away as this advanced; and it has occupied the whole space of the building for about twelve years. This is without doubt the most complete fruit-bearing plant that ever came within my observation.

In the former memorial I mentioned that no other plants were placed to grow under this Vine; but it would have been more correct in me to have said, "No "other plant will thrive under the shade "of these Vine-leaves; for every pane "of glass is nearly covered on the under-"side, so that a clear uninterrupted "light

" light cannot extend to the ground, and
" that is found to be very necessary for
" the support of a healthy vegetation."

It is well worthy of remark, that this Vine, from being excluded from the external air, little heated by fire, kept perfectly clean, and regularly attended through all its progress, IS NOT SUBJECT TO BLIGHT; neither is it liable to many other casual evils, to which fruit-bearing trees are much disposed: and other fruit-trees would be as clear from blight as this Vine, were they as well guarded from injuries.

In the Papers forming a Treatise on Blight, which the Society have honoured by publishing in their Transactions, I remarked, " We cannot afford to place
" our plantations within hot-houses for
" their protection; yet the principles of
" blight being established, and known,
" that under shelter it may be prevented,
" will be found of very essential service

" in

" in general practice, by leading man-
" kind to advert to the natural causes
" of blight, and from those sources to
" establish a system of proper precau-
" tions; or, having happened, in part to
" remove the ill effects arising therefrom,
" as are expressed in Classes 80 to 83
" for the Premiums offered." This I have much enlarged upon in former Papers, to good purpose, for practice, and here repeat: Prune, wash, manure, and perform any operations rationally tending to keep the *trees in health;* but by all means scrape off the rotten bark, and smear the trees over with oil, and any cheap drug to offend the insects, as recommended in the 18th volume.

When the area of glass was only 1,300 square feet, the Vine was permitted to carry each year 1,800 bunches of grapes. As the area is now enlarged to 1,730 feet, it is presumed the plant will well support 2,400 bunches.

To

To such as are but little acquainted with subjects of this kind, it may seem singular that it should be possible to predict the number of bunches the Vine is to produce in each year. Such persons should be informed, that the plant is not permitted to follow its own natural propensities, either in growth or bearing, but is kept perfectly under the controul of the gardener. Were the plant left to itself, the individual grape or bunches would not be so large, neither would they ripen so well, or produce the beautiful bunches which are seen there at present.

This is a very proper place for me to request of those who are entrusted with the management of valuable fruits, to be attentive to thin them sufficiently in due time; to foresee how the crop is likely to fill up, by reflecting on the natural size of the fruit; and never to suffer any part of the tree to be overloaded, or the fruit much cluttered together.

gether. Such neglect not only injures the present crop, but prevents the plant from continuing in sufficient strength to throw out the blossoms, and have them duly impregnated for the next summer's production. In the first Paper which I presented to the public upon Orcharding, I took care to place this subject in its proper light, observing, that it is the fine fruit which sells the orchard, and invariably produces the most credit, pleasure, and profit to the grower.

I think, in some of the former Papers, I have mentioned, that in the fruit-bearing trees, the fruit improves as the tree advances in strength, and after that time as gradually declines. The Cherry will go on some time longer.

The public should be attentive to names and discriminations of the different fruits, as of consequence in the improvement of the art. This Vine is called the Black Hamburgh; but I should suspect, from the freedom of growth,

growth, health, and regular good bearing, that it is a new variety. This term, with regard to fruits, is fully explained in the 17th volume of the Transactions of the Society, and in the second volume of the Orchardist.

Where the stem enters the house, it now girts sixteen inches; and, to give some appearance of proof for what I advanced with regard to the probable duration, Speechley, on the Culture of the Vine, mentions, that Strabo observed that flooring-boards were cut out of the stems of Vines; consequently they must have grown to a large size in those climates, and lived to a great age: and very slight reflexion will convince the practitioners, that an extensive forcing-house is the finest station in the world for the grape, under such culture as it will probably meet with in the royal gardens; because a forcing-house may be accommodated to any climate.

It

It has been before remarked, that some branches of this Vine run more than a hundred feet, and that the grapes growing on the extreme ends are the finest fruit: and, to ascertain some experiments, Mr. Padley obligingly intends, when the time of training arrives, to attempt to lead one of the longest and clearest branches directly horizontal on the wall, under the highest range of glass. This idea will require some years to accomplish, but when effected will add 70 feet to the present 100, and will make a run of 170 feet round the three sides of the house. Thus, for instance, stem 8 feet + 72 + 21 = 101; add the returned run of 70 feet from north to south, and the total will be 171 feet in length. I do not apprehend that any tree in Britain has run to such an extent.

I have been the more induced to attend to the culture and growth of this Vine, from a desire of improving the mode of forcing grapes, both as to the manner

manner of applying the fire and construction of the buildings, so as to produce a great quantity of fine perfectly ripe forced grapes at a small expense. I wrote an Essay on this subject three years ago. Should any further material circumstance affect this Vine during my time, I shall take care to present the same to the Society.

I am, SIR,

Your most obedient Servant,

THOMAS SKIP DYOT BUCKNALL.

Hampton-Court,
8th October, 1801.

CHARLES TAYLOR, Esq. Secretary.

The

The THANKS of the Society were this Session presented to THOMAS SKIP DYOT BUCKNALL, Esq. for the following Communication on the NATURE of the VARIETIES of ENGRAFTED FRUIT-TREES, and his Plan for increasing the Number of new valuable Fruits.

SIR,

SOME friends have requested that I would introduce another Paper on the Nature of the valuable Varieties of engrafted Fruits, as they are of opinion that the Essay in the 17th Volume of the Transactions of the Society is not sufficiently extended for a subject so important to the Fruit-growers, and those interested in the productions of Fruits. As a proof of my willingness to make the Orchardist as perfect as I can, I beg you to present my compliments to the Society, with the following elucidations.

This

This is a subject in rural economy which ought to be much better understood than it is, in order to enable the planters to judge of the sorts proper to be planted, either as an article of pleasure, profit, or recreation; as much of the credit of the plantation must arise from judiciously choosing Trees of the best, new, or middle-aged sorts, and not of the old worn-out varieties, which latter cannot, in the planting of Orchards in common situations, ever form *valuable Trees*, and must end in the disappointment of the planter.

Engrafted Fruits, I have before said, and I now repeat, are not permanent. Every one of the least reflexion must see that there is an essential difference between the power and energy of a seedling plant, and the tree which is to be raised from cuttings or elongations. The seedling is endued with the energies of nature, while the graft, or scion, is nothing more than a regular elongation,

carried perhaps through the several repeatings of the same variety; whereas the seed, from having been placed in the earth, germinates and becomes a new plant, wherever nature permits like to produce like in vegetation; as in the oak, beech, and other mast-bearing trees. These latter trees, from each passing through the state of seedlings, are perfectly continued, and endued with the functions of forming perfect seeds for raising other plants by evolution, to the continuance of the like species.

This is not the case with engrafted Fruits. They are doomed by nature to continue for a time, and then gradually decline, till at last the variety is totally lost, and soon forgotten, unless recorded by tradition, or in old publications.

Reason, with which Providence has most bountifully blessed some of our species, has enabled us, when we find a superior variety, to engraft it on a wilding stock, or to raise plants from layers

and

and cuttings, or even to raise up the roots, and thus to multiply our sources of comfort and pleasure. This, however, does not imply that the multiplication of the same variety, for it is no more, should last for ever, unless the species will naturally arise from seed.

Nature, in her teaching, speaks in very intelligible language, which language is conveyed by experience and observation. Thus we see that among promiscuous seeds of fruits of the same sort, one or more may arise, whose fruits shall be found to possess a value far superior to the rest in many distinguishable properties. From experience, also, we have obtained the power, by engrafting, of increasing the number of this newly-acquired tree, can change its country, give it to a friend, send it beyond the seas, or fill a kingdom with that fruit, if the natives are disposed so to do. Thus we seem to have a kind of creative power in our own hands.

From the attention lately paid to the culture of engrafted Fruits, I hope we are now enabled to continue a supposed happily acquired tree, when we can find it, for a much longer duration than if such variety had been left in the state of unassisted nature; perhaps I may say for a duration as long again, or something more. After these sanguine expectations, I may reasonably be asked, to what does all this amount? for here there is no direct permanency—and why? The *why* is very obvious—because the kernels within the fruit, which are the seed of the plants for forming the next generation of trees, will not produce their like. I allow they may do so accidentally; but nothing more can be depended on.

For example, suppose we take ten kernels or pips of any apple raised on an engrafted stock: sow them, and they will produce ten different varieties, no two of which will be alike; nor will either

of

of them closely resemble the fruit from whence the seeds were collected. The leaves also of those trees raised from the same primogenious or parent stock, will not *actually* be a copy of the leaves of any one of the varieties or family, to which each is connected by a vegetable consanguinity. I intentionally used the word *actually*, because a resemblance may be found, though not much of that is to be expected.

I beg that what has been last mentioned may not be taken as a discouragement to attempts for raising new varieties. I was obliged to speak very strongly, in order to place the culture upon its true foundation. I think it need not be observed, that there is no acquiring a new variety, but through the means of a seedling plant; and therefore whoever wishes to succeed must attempt it that way, or wait till others in their plantations may more fortunately produce it.

In choosing the seeds, that apple is most likely to produce the clearest and finest plants, whose kernels are firm, large, and well ripened. The size of the fruit is not to be regarded; for large apples do not always ripen their fruit well, or rather for cider the small fruits are generally preferred for making the strongest, highest-flavoured liquor. And from what I have been able to collect in the cider-countries, it is there the opinion, that an apple something above the improved crab promises the best success. This advantage also attends the practice: if there are no valuable apples raised from that attempt, these wildings will make excellent stocks to engraft upon.

Gentlemen who actually employ themselves in attempting to acquire new varieties, should remember that they ought to select all the sets, from the bed of apple-quick, whose appearance is in the least degree promising, and plant them together, at such a distance as to allow each

each to produce its fruit, which will happen in about twelve, fifteen, or eighteen years. My friend Mr. Knight, who undoubtedly is the first in actual exertions for procuring these happily acquired new varieties, has had two plants bear fruit at six years old, and one at five. The cider-countries have offered several premiums for procuring new varieties, and some with good effect. Premiums have been given both to Mr. Knight and Mr. Alban.

When the new variety is to be raised from a valuable *admired* apple, I should recommend the placing these seeds in a garden-pot, filled with mould from an old melon-bed; carrying the pot into a retired situation near the water, and giving attention to run the plants to as large a size as is convenient within eighteen months. With this view, the pot should be placed in the green-house the first winter; and when the plants are afterwards to be set out in the spots,

they should not be placed under the drip of trees, or much exposed to the winds.

Two instances have been mentioned, the improved crab, and most admired apple; but prudence says, try all sorts, and something probably will arise; and the process is attended with little trouble or expense to a person who constantly resides in the country: yet, after all this scientific care, the apple may want flavour, and be in other respects nothing better than a common wilding.

It is an undoubted fact, and worthy of observation, that all the different trees of the same variety have a wonderful tendency to similarity of appearance among themselves; and that the parent stock, and all engrafted from it, have a far greater resemblance to each other, than can be found in any part of the animal creation; and this habit does not vary to any extent of age.

As

As an encouragement in attempting to increase the number of new valuable fruits, we can prove that the golden pippin is native English. The red-streak, a seedling of Herefordshire, if not raised, yet was first brought into notice by Lord Scudamore, and was for a long time called Scudamore's Crab. The Stire Apple was accidentally raised in the Forest of Dean, in Glocestershire, and took the name of *Forest Stire*. The cider made from this apple was the strongest the country ever produced, according to any living record. The Haglo-crab, the best cider fruit now remaining, was discovered in the parish of Ecloe, on the banks of the Severn; and, about sixty or seventy years ago, many scions were taken from this tree by Mr. Bellamy, and engrafted on seedling stocks about Ross. These are now grown old; and, to ascertain the age of the variety, I went with Charles Edwin, Esq. to Ecloes, in hopes of seeing the primogenious of this family.

The

The proprietor of the estate acquainted Mr. Edwin that it had ceased to bear years ago, and was cut down. Those at Ross are but poor bearers now, and I should suppose the variety must be 140 years old, though Marshal, who wrote in the year 1786, mentions these trees were prolific, and he supposes the sort to be about eighty years old; but, from present experience, it must be much more. The Tinton Squash-pear is of Glocestershire; the Barland and Old-field were near Ledbury, Herefordshire. The two last pears clearly bear the names of the two fields where they were raised. The Barland fell about six years ago, visibly from weight and longevity, which was supposed to have been about 200 years. There have been many other names of estimation handed down to us, though the realities are now totally worn out, and have ceased to exist. Can any better proof be desired, that engrafted fruits are not permanent, than the regret

we

we feel for the loss of these old valuable fruits.

To make my Paper as short as convenient, I have dwelt only on the Apple and Pear; yet all the engrafted fruits are under the same predicament of the seed not producing its like, and the offspring in time falling into a nothingness of growth and bearing, though that space of time must certainly depend on the natural longevity and hardiness of the sort, soil, position, care, etc. All these are more fully expressed in the papers published in the different volumes of the Transactions of this Society, and the two volumes of the Orchardist, wherein the whole system is extended, to form a rational culture for the management of Standard Fruits.

It should be remembered, that as I am now alluding to the state of actual permanency, fifty years are to be accounted as nothing; and as often as we come to that point, we are compelled to resort

resort to our first assertion, "That en-
"grafted fruits are not permanent, they
"being continued from elongations, and
"not raised as a repetition of seeds."
This is the only rational way as yet introduced of accounting for the loss of the valuable old varieties of fruits. Should a better system be introduced, I shall readily adopt it; but this sufficiently answers the purposes of the planter.

Some years ago, from due investigation and thorough conviction, I propagated this principle; and it was published in the 17th volume of the Society's Transactions, in the following words: "All the grafts taken from this first tree, "or parent stock, or any of the descend-"ants, will for some generations thrive; "but when this first stock shall, by mere "dint of old-age, fall into actual decay, "a nihility of vegetation—the descend-"ants, however young, or in whatever "situation they may be, will gradually "decline; and, from that time, it would

"be

" be imprudent, in point of profit, to " attempt propagating that variety from " any of them. This is the dogma which " must be received, I do not expect a " direct assent, neither do I wish it, for " it should be taken with much reserve; " but it is undoubtedly true." These considerations should stimulate us in searching after new varieties, equal, or perhaps superior, to those of which we regret the loss.

Observe that, from the time the kernel germinates for apple-quick, should the plant be disposed to form a valuable variety, there will appear a regular progressive change, or improvement, in the organization of the leaves, until that variety has stood, and grown sufficient to blossom and come into full bearing; that is, from the state of infancy to maturity; and it is this and other circumstances, by which the inquisitive eye is enabled to form the selection among those appearing likely to become valuable

valuable fruits. But from that time the new variety, or selected plant, compared with all the engraftments which may be taken from it, or any of them, these shall shew a most undeviating sameness among themselves.

It is readily allowed, that the different varieties of fruits are easily distinguished from each other by many particulars, not only respecting their general fertility, and the form, size, shape, and flavour of the fruit, but also the manner of the growth of the tree, the thickness and proportion of the twigs, their shooting from their parent stem, the form, colour, and consistence of the leaf, and many other circumstances, by which the variety can be identified; and were it possible to engraft each variety upon the same stock, they would still retain their discriminating qualities, with the most undeviating certainty.

The proper conclusion to be drawn from the statement in the last paragraph,

is

is this—that were any one to put the thought in practice on a full-grown hardy or crab stock, it would produce an excellent proof that engrafted fruits are not permanent. For if twenty different varieties were placed together, so that each might receive its nurture from the same stem, they would gradually die off in actual succession, according to the age or state of health of the respective variety, at the time the scions were placed in the stock; and a discriminating eye, used to this business, would nearly be able to foretell the order in which each scion would actually decline. Should it also happen that two or three suckers from the wilding stock had been permitted to grow among the *twenty grafts*, such suckers or wilding shoots will continue, and make a tree after all the rest are gone. A further consequence would result from the experiment: among such a number of varieties, each of the free growers would starve the delicate,

and

and drive them out of existence only so much the sooner. It must be observed, that this supposed stem is the foster-parent to the twenty scions, and real parent to the suckers; and those the least conversant with engrafted fruits know the advantage acquired from this circumstance. And here it is worth while remarking, that a Gascoyne, or wild cherry, will grow to twice the size that ever an engrafted cherry did.

By an experiment we have had in hand for five years, it will appear that the roots and stem of a large tree, after the first set of scions are exhausted or worn out, may carry another set for many years; and we suspect a third set, provided the engrafting is properly done, and the engrafter chooses a new variety. Now the Ripston Pippin, of Yorkshire, is the favourite, as being a free grower and good bearer, with fine fruit. This however may be certainly depended on, that when a new apple is raised from seed,

if

if a scion were placed in a retired situation, and constantly cut down, as a stool in a copse-wood, and the apple never suffered to fulfil the intentions of nature in bearing fruit, the practitioners of the following ages may secure scions from that stool, to continue the variety much longer. Hence, though I have written as much as is in my power against permanency, yet I have taken some pains to assure the planters, that forecast, selection, pruning, cleanliness, and care, will make the orchards turn to more profit for the rising generations, than what they have done for the last hundred years.

To place the nature of varieties in its true light, for the information of the public, I must maintain, that the different varieties of the apple will, after a certain time, decline, and actually die away, and each variety, or all of the same stem or family, will lose their existence in vegetation; and yet it is a

known fact, and mentioned in the 17th volume of the Transactions, that after the debility of age has actually taken possession of any variety, it will yet thrive by being placed against a southern wall, and treated as wall-fruit. Who, however, can afford to raise cider at that expense, except as matter of curiosity, to prove, that when the vital principle in vegetation is nearly exhausted, a superior care and warmth will still keep the variety in existence some time longer?

It should be understood, that the external air of Britain is rather too cold for the delicate fruits, which is the reason why, in the Orchardist, I lay such a stress on procuring *warmth* for the trees, by *draining*, *shelter*, and *manure*. It would be now lost time to attempt to recover the old varieties as an article of profit.

If I have not expressed myself, in this Essay on the Nature of Varieties, with

so much clearness and conviction as might have been expected, it should be considered that it is an abstruse subject, very little understood, and requiring at first some degree of *faith*, *observation*, and *perseverance*. The prejudices of mankind revolt against it. They are not disposed to allow the distinction of nature; and they imagine, that in the act of engrafting or multiplying they give new life, whereas it is only continuing the existence of the same tree, stick, or bud. Observe what I said before:—the seed of the apple, when placed in the earth, germinates, and unfolds itself into a new plant, which successively passes through the stages of infancy, maturity, and decay, like its predecessors. I might say, all created nature is similar in this respect; though, from the circumstance that varieties are much longer-lived than man, the plants have appeared to be possessed of eternal

powers of duration: nothing sublunary, however, which possesses either animal or vegetable life, is exempt from age and death.

Within the last twenty years I have travelled many hundred miles, and conversed with the most intelligent men in each country; and I now want to convince mankind, for no other reason than because it is their interest so to believe, that there is in creation an order of beings (engrafted fruits) so formed, that we have the power of multiplying a single variety, to whatever number of trees we please;—that the first set arises from a small seed;—that the next and descendant sets are propagated by engraftings, or from cuttings, layers, etc.; —and that although these trees may amount to millions, yet, on the death of the primogenious or parent stock, merely from old-age, or nihility of growth, each individual shall decline,

in

in whatever country they may be, or however endued with youth and health. I say they shall gradually begin to decline; and in the course of time, or of centuries, to those who would prefer that expression, the *whole variety* will scarcely have a single tree remaining to show what the fruit was. Let those who are not disposed to assent to this statement, ask themselves what is become of the old lost varieties? did they die, or did wicked men maliciously cut them up?

I, who am firmly convinced of the truth of what I have advanced on this subject, have no doubt but that the same would happen by engrafting on the Oak or Beech, if the mast raised from the engrafted tree did not produce the like; for there the question turns.

Is it not known, that the woodman, in setting out his sapling oaks, always selects new seedling plants, and never

continues one upon an old stool; and that if he should so blunder, that tree, from the stool, will neither have the freedom of growth, nor the size or firmness of timber, equal to a new-raised plant.

I wish I could persuade my friends, that, with the same attention with which the woodman acts, the planter is to raise his orchard from the young fruits which thrive in the neighbourhood, or are in health and full bearing in the country whence they are to be brought.

The fruit-grower should look to selection, cleanliness, and care. To me it is a circumstance perfectly indifferent, whether he is to use Mr. Forsyth's composition, Mr. Bulingham's boiled linseed oil, or my medication. I only maintain that the wounded parts of trees want something to destroy the insects and vermin, and heal the wood, from which the trees are kept in health.

Let

Let those who are blessed with fruit-plantations attend to their preservation, and not leave them to the state of unassisted nature.

I am, SIR,

Your most obedient Servant,

THO. SKIP DYOT BUCKNALL.

Hampton-Court,
12th Oct. 1801.

Mr. CHARLES TAYLOR,
Secretary, Adelphi.

The SILVER MEDAL was this Session presented to WILLIAM FAIRMAN, Esq. of Millers-House, near Sittingbourn, in Kent, for his Experiments on Extreme-Branch Grafting of FRUIT-TREES, from whom the following Account and Certificates were received, and to which an Engraving and Description are annexed.

SIR,

FROM much conversation with Mr. Bucknall on the idea of improving standard Fruit-trees, we could not but remark that in Apple Orchards, even in such as are most valuable, some were to be seen that were stinted and barren, which not only occasioned a loss in the production, but made a break in the rows, and spoiled the beauty and uniformity of the plantation.

To bring these trees into an equal state of bearing, size, and appearance, in a short

a short time, is an object of the greatest importance in the system of Orcharding, and also for the recovery of old barren trees, which are fallen into decay, not so much from age, as from the sorts of their fruits being of the worn-out and deemed nearly lost varieties.

Having long entertained these thoughts, and been by no means inattentive to the accomplishment of the design, I attempted to change their fruits by a new mode of engrafting, and am bold enough to assert that I have most fortunately succeeded in my experiments; working, if I am to be allowed to say it, from the errors of other practitioners, as also from those of my own habits.

My name having several times appeared in the transactions of the Society for the Encouragement of Arts, etc. and having the honour of being a member of that Society, I thought no pains or expense would be too much, for the completion of so desirable an improvement.

ment. Under these impressions, and having many trees of this description, I made an experiment on three of them in March, 1798, each being nearly a hundred years old. They were not decayed in their bodies, and but little in their branches. Two of these were golden pippins, and the other was a golden rennet. Each likewise had been past a bearing state for several years. I also followed up the practice on many more the succeeding spring, and that of the last year, to the number of forty at least, in my different plantations. *

The attempt has gone so far beyond my most sanguine expectation, that I beg of you, Sir, to introduce the system to the Society, for their approbation; and I hope it will deserve the honour of a place in their valuable Transactions.

I directed the process to be conducted as follows: Cut out all the spray wood, and make the tree a perfect skeleton, leaving

* The average expense I calculated at 2s. 6d. each tree.

leaving all the healthy limbs; then clean the branches, and cut the top of each branch off where it would measure in circumference from the size of a shilling to about that of a crown piece. Some of the branches must of course be taken off where it is a little larger, and some smaller, to preserve the canopy or head of the tree; and it will be necessary to take out the branches which cross others, and observe the arms are left to fork off, so that no considerable opening is to be perceived when you stand under the tree, but that they may represent an uniform head. I must here remark to the practitioner, when he is preparing the tree as I directed, that he should leave the branches sufficiently long to allow of two or three inches to be taken off by the saw, that all the splintered parts may be removed.

The trees being thus prepared, put in one or two grafts at the extremity of each branch; and from this circumstance

I wish

I wish to have the method called *Extreme Branch Grafting*.

A cement, hereafter described, must be used instead of clay, and the grafts tied with bass or soft strings. As there was a considerable quantity of moss on the bodies and branches of the trees, I ordered my gardener to scrape it off, which is effectually done when they are in a wet state by a stubbed birch broom. I then ordered him to brush them over with coarse oil, which invigorated the growth of the tree, acted as a manure to the bark, and made it expand very evidently; the old cracks were soon, by this operation, rendered invisible.

All wounds should be perfectly cleaned out, and the medication applied as described in the Orchardist, p. 14. By the beginning of July the bandages were cut, and the shoots from the grafts shortened, to prevent them from blowing out. I must here, too, observe that all the shoots or suckers from the tree must

enjoy

enjoy the full liberty of growth, till the succeeding spring, when the greater part must be taken out, and few but the grafts suffered to remain, except on a branch where the grafts have not taken: in that case, leave one or more of the suckers, which will take a graft the second year, and make good the deficiency. This was the whole of the process. *

By observing what is here stated, it will appear that the tree remains nearly as large when the operation is finished, as it was before the business was undertaken; and this is a most essential circumstance, as no part of the former vegetation is lost, which is in health fit to continue for forming the new tree.

It is worthy of notice, that when the vivifying rays of the sun have caused the sap to flow, these grafts inducing the

* The system succeeds equally well on pear, as also on cherry trees, provided the medication is used to prevent the cherry tree from gumming.

the fluid through the pores to every part of the tree, will occasion innumerable suckers or scions to start through the bark, which, together with the grafts, give such energy to vegetation, that in the course of the summer the tree will be actually covered over by a thick foliage, which enforces and quickens the due circulation of sap. These, when combined, fully compel the roots to work for the general benefit of the tree.

In these experiments I judged it proper to make choice of grafts from the sorts of fruits which were the most luxuriant in their growth, or any new variety, as described in the 17th and 18th volumes of the Society's Transactions, by which means a greater vigour was excited; and if this observation is attended to, the practitioner will clearly perceive, from the first year's growth, that the grafts would soon starve the suckers which shoot forth below them, if they were

were suffered to remain *. With a view to accomplish this grand object of improvement, I gave much attention, as I have before observed, to the general practice of invigorating old trees; and I happily discovered the error of the common mode of engrafting but a short distance from the trunk or body, as in *Fig.* 1. There the circumference of the wounds is as large as to require several grafts which cannot firmly unite and clasp over the stumps, and consequently these wounds lay a foundation for after-decay. If that were not the case, yet it so reduces the size of the tree, that it could not recover its former state in many years, and it is dubious if it ever would; whereas, by the method of extreme grafting, as *Fig.* 3, the tree will be larger in three or four years, than before the operation

* This thought should be kept in suspense, as ten years hence it may appear otherwise. However, they will be valuable trees, and highly profitable, as will any other brought under the same system.

tion was performed. For all the large branches remaining, the tree has nothing to make but fruit-bearing wood; and from the beautiful verdure it soon acquires, and the symmetry of the tree, no argument is necessary to enforce the practice.

Fig. 2 was my first experiment about eight years since. The error of No. 1 was there a little amended, and gave me the idea of engrafting at the extremity. Permit me to remark that those done in my Orchards, on the plan of *Fig.* 2, did not, neither were they able to bear so many apples last season, which was a bearing year, as those on the plan of *Fig.* 3, which produced me about two bushels each tree of the finest fruit I had in my Orchards, from the third summer's wood only. Some engrafted with Ribston pippins were beautiful.

Mr. Bucknall visited me this summer for the express purpose of seeing my trees; and he says the manner of conducting

ducting the system is the happiest that ever was conceived. For when a tree has done its best, and has continued to extreme old-age, just disposed to fall into dissolution, as also when this is the case with trees in a stagnated and barren state, they are thus renovated, and may, with the greatest probability, continue valuable for fifty years to come. I need not say, do not make the attempt when the energy of growth is over; that will easily be seen by the body and arms, but more particularly from the size, figure, shape, and colour of the leaves, which give the proper indication of health or decay in vegetation.

Should the Society desire it, several gentlemen resident here, will gladly send up certificates to confirm the statements.

I remain, SIR,

Your most obedient Servant,

WM. FAIRMAN.

Millers-House, near Sittingbourn, Kent,
Feb. 9, 1802.

CHARLES TAYLOR, Esq.

CEMENT FOR ENGRAFTING.

One pound of	pitch	To be boiled up together, but not to be used till you can bear your finger in it.
One do. . . .	rosin	
Half do. . . .	beeswax	
Qtr. do. . . .	hogslard	
Qtr. do. . . .	turpentine	

SIR,

THIS is to certify to the Society for the Encouragement of Arts, etc. that William Fairman, of Millers-House, Lynsted, Esq. has long been a steady and zealous promoter of the improvement of the standard fruits of the country; and that he planted one entire Orchard, of sixteen acres, ten years ago.

The system of extreme-branch grafting, now introduced to the public, he has had in contemplation full eight years, though not in its present style of success

success and elegance; for he has been improving. In those operated upon within the last three or four years he has been wonderfully successful, and I am happy in an opportunity of adding my testimony to the advantages resulting from this method of renovating old fruit-trees.

An idea equal to the present system could not have fallen into better hands than those of Mr. Fairman. He is blessed with a good soil, cultivates the land well, and steadily attends to improvement. The gentlemen of the Committee, by looking at the three little sketches of drawings which represent the three trees, will see that *Fig.* 1 is so amputated, as not likely to continue in health, so as again to form a good tree; and that *Fig.* 2 will be many years before, if *ever* it does. But there are now many fine large trees in the state of *Fig.* 3, which have been engrafted but three or four years, and yet, as far

as structure goes, are complete already, and in two years much fine fruit may be expected.

The system is as follows: Make the trees perfectly clean, and keep them as uniformly large as is convenient.

In autumn, 1801, I spent some days at Lynsted, and several times walked over the Plantations with Mr. Fairman, and was very much pleased with their appearance.

I remain, SIR,

Your obedient Servant,

THOMAS SKIP DYOT BUCKNALL.

February 22, 1802.

CHARLES TAYLOR, Esq.
Secretary.

RE-

Mr. Wm. Fairman's Method of Extreme Branch Grafting.

Fig. 1.

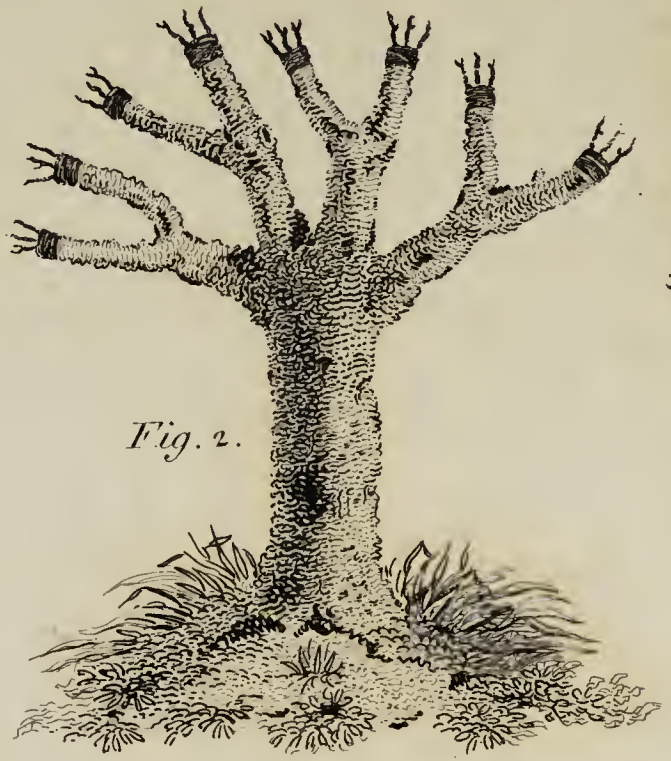


Fig. 2.

Fig. 3.

Fig. 4.

S. Porter sc.

REFERENCE *to the Engraving of* Mr. FAIRMAN's *method of Extreme-Branch Grafting*; *Plate* I. *Fig.* 1, 2, 3, 4.

Figure 1. displays the old practice, commonly called Cleft-Grafting.

Fig. 2. Improved experiment on *Fig.* 1, by engrafting higher up the tree.

Fig. 3. shows the method of Extreme-Branch Grafting, recommended from experience, by Mr. Fairman. Two grafts or cyons are there placed at the extremity of each branch; besides which, additional grafts are inserted in the sides of the branches; as, at AAAAAA, or where they are wanted to form the tree into a handsome shape.

Fig. 4. shows upon a larger scale than the former figures the method of applying the grafts at the extremity of the branches, and retaining them by the bass-mat bandage and cement.

The GOLD MEDAL, being the Premium offered for SOWING, PLANTING, and ENCLOSING TIMBER-TREES, was this Session adjudged to THOMAS JOHNES, Esq. M.P. of Hafod in Cardiganshire; from whom the following Accounts and Certificates were received,

SIR,

I SHALL shortly forward to you the particulars of the Timber-trees which I have planted between the 1st of October, 1797, and the 1st of May, 1799.

My plantations are generally made on such land as I cannot plough, that my best ground may be reserved for grain and grass. I plant the sides of mountains, which are almost universally composed of argillaceous shistus, or slate-rock; the surface of which is decomposed by exposure to the atmosphere,

sphere, and admits the roots of trees to penetrate therein, and to grow luxuriantly. The land betwixt the mountains consists of peat-earth, which, when well drained and limed, produces good grain, potatoes, yams, or grass. I am at present engaged in a course of experiments to ascertain what kind of cows will answer best in this country. A gentleman farmer, who was here last week, insisted that though the Guernsey cows gave but little milk, yet that it contained more butter and cheese than other cows milk. I therefore made a trial, and found the following result;

Devon cows	gave of butter	7 oz. $\frac{7}{8}$
Small Scotch cows	do.	6 oz.
Guernsey cows ...	do.	$5\frac{1}{2}$ oz.

Devon cows	gave of cheese ...	1 lb. 8 oz.
Small Scotch cows	do.	$14\frac{1}{2}$ oz.
Guernsey cows ...	do.	13 oz.

I have sent my friend Dr. Anderson a sample of my Wheat grown here; and

those to whom he has shown it said it was the finest they had seen.

My crop is supposed to be thirty bushels per acre; and yet there are persons, pretendedly knowing, who declared that Wheat could not be grown here.

This crop was on very high exposed ground.

I am, SIR,

Your obedient humble Servant,

T. JOHNES.

Hafod,
September 25, 1801.

To Mr. CHARLES TAYLOR.

An

An Account *of* Trees *planted by* Thomas Johnes, *Esq. on Hafod Estate.*

PLANTED from October 1797, to October 1798, ten thousand Oaks, from one to two feet high; they were planted betwixt four and five feet asunder, according to the size of the plants: the ground was properly inclosed with a stone wall, five feet high.

Planted, betwixt the first of October, 1797, and the first of May, 1799, twenty-five thousand Ash-trees: they were from one to three feet high, and are planted on ground which could not be ploughed, or otherwise improved to advantage, being on the sides and lower parts of hills, as the upper parts of the hills are always planted with Larches. The trees look well, and make good shoots. From the nearest calculation I can make, I think there are not above five hundred

of

of them dead; the ground was previously well inclosed, and the Ashes are planted from six to eight feet asunder.

Planted, betwixt October 1797, and 1st May, 1799, four hundred thousand Larch-trees; all of them two years old seedlings, from twelve inches to two feet high: they are at this time looking very healthy, and make good shoots. They are planted upon the tops of the hills where there is a very thin stratum of soil; they were planted about two feet asunder, and the ground inclosed previously with a stone wall. The Larches were all planted in the following manner:—A man with a spade, holding the edge of it towards him, makes a cut about six inches deep, if there is that depth of soil; he then turns the spade the right way, and makes a cut across the end of the other thus ⊥: he then works his spade backwards and forwards three or four times, to loosen the mold for the roots of the plants to grow therein.

A boy

A boy attends, with a bundle of trees, to assist every man: the boy puts one tree in each hole, and presses with his foot the turf hard about the roots, to make the tree stand firm.

Whilst the planter is making another hole, a person who attends the planting goes from one planter to another, to see that every man does his duty; he takes hold of the top of each tree, to see that they are properly planted and firm: they are generally put in so hard, that the top will break before they will pull up. If it be late in the spring season, and dry weather apprehended, I have found it of great service to drench the roots well in the following manner, viz: A hole is dug about two feet diameter, and the same in depth; it is then half-filled with water, and fine mold is added, to make it like thin mud; a man then takes as many trees in both his hands as he can conveniently hold and drench in the mud: having pre-

pared

pared a heap of dry soil near the side of the hole, he alternately draws the roots of the plants through the above mud-hole and the dry soil, and thus the fibres of the roots are prevented from hardening or drying, as they would otherwise do.

Mr. Johnes has a plantation of Larches which were set in April 1796, which were treated in the above manner; and although they had no rain for almost two months after they were planted, I believe that out of eighty thousand thus planted on a very dry hill, not above two hundred of them died. The Larches were planted at two feet asunder, or about ten thousand to the acre. The soil where the Larch, Oak, and Ash-trees have been planted, is chiefly of a red loam, on a slaty rock.

The stone walls which surround the plantations are all kept in proper repair by a man who has a yearly allowance for that purpose. Mr. Johnes also employs

ploys a man to go daily round the plantations with a dog, to keep them free from trespass.

All the plantations are in a healthy and flourishing condition at this time.

JAMES TODD, *Gardener.*

Hafod,
December 31, 1801.

MR. CHARLES TAYLOR.

Certificates from the Reverend Lewis Evans, Minister of Eglwys Newydd, accompanied the above accounts, and confirmed the particulars. He stated that he had lately walked over the different plantations, and found them in a thriving condition. He added, that all the plantations made by Mr. Johnes are on a soil that could not be otherwise cultivated at any moderate expence; that the kingdom in general will soon experience their beneficial effects,

effects, and reap incalculable advantages from them.

By an account received from Mr. Todd, in August, 1802, it is stated that he has measured a good number of Larches planted by Mr. Johnes, on a reddish loam, inclining to sand, in April, 1796, which when planted were from eighteen inches to two feet high; and he finds that they are now in general from ten to thirteen feet high. Some of the last year's shoots measured three feet, eight inches; and the greatest part of them are from two and a half to three feet. He observes that the medium growth of Larches in general, in Mr. Johnes's plantation, is from twenty inches to two feet each year; some years more, and some less.

[A further account of this Gentleman's improvements will be found in the Preface to the present Volume.]

The

The SILVER MEDAL was this Session presented to JAMES BEECH, Esq. of Shaw, near Cheadle, in Staffordshire, for his Plantations of TIMBER-TREES. The following Accounts and Certificates were received from him.

SIR,

HAVING made sundry improvements in planting and draining, I lay the account before the Society, in hopes of their approbation.

Betwixt June, 1798, and June, 1799, I planted 11,000 Oaks, 9,000 Sycamores, 9,000 Ashes, 17,000 Mountain Ashes, 3,000 Larches, 1,800 Elms, and 18,000 Beeches; making in the whole 52,600 trees. The trees are well fenced by banks, rails, and quickset hedges, and they are all in a healthy state.

I have drained 8,580 roods of land, at 69 roods per acre. The drains were generally made two grafts deep; fine broken

broken stones were afterwards laid thereon, and over that turf-sod.

I am, SIR,

Your obedient Servant,

JAMES BEECH.

Cheadle, August 13, 1799.

To the SECRETARY of the
Society of Arts, etc.

The above Account was confirmed by the Rev. William Eddowes, Minister, who testified, that the drained land, which was only worth five shillings per acre per annum, is now worth thirty shillings; and that he believes Mr. Beech has planted more Timber-trees than are stated in the account.

SIR,

SIR,

I RECEIVED your letter respecting my application to the Society; and, in answer thereto, inform you, that the Trees I have planted are as prosperous as possible, and well preserved with very nice quickset hedges growing round the different plantations. My land is very much upon the clay; it suits all kinds of Trees described in my letter exceedingly well, particularly Oak, which, in older plantations that I have made, shoots near four feet long in one year. Beech seems the least inclinable to answer on this soil. Part of the land was ploughed and thrown up into butts, and part planted in the turf. Those Trees planted on the ploughed ground flourish the most. The whole has been trenched with open drains, to let the wet off where necessary, which is a very material point. I sowed last spring about twelve

strike of Acorns, of which I will give you an account in a future letter.

I am, SIR,

Your obedient Servant,

JAMES BEECH.

Cheadle, October 22, 1800.

Mr. CHARLES TAYLOR.

SIR,

I SOWED in the spring of 1799 about half an acre of land with Acorns. The quantity of Acorns sown were about twelve or thirteen strike. The land is taken from the common, and was previously well fallowed as the cleanest wheat fallow. I compute that at least one hundred and fifty Acorns were sown in a square yard, which makes about three hundred and sixty-three thousand in the whole. They are planted out as they come on in size, the youngest plants being left. I sowed, in the same spring, as many Ash Keys as produced at least fifty thousand plants, which have been thinned

thinned out, and distributed into plantations in the same manner. I also sowed, in the same spring, about fifteen strike of Mountain-Ash Berries. These cannot have produced less than four hundred thousand plants, which have been thinned out in the same manner when they began to injure the smaller plants.

The beds for the Ash and Mountain Ash were dug and made perfectly clean. The Mountain Ash seed did not spring so well as the others, as the birds will not suffer the Berries to ripen sufficiently.

This country is mostly of a stiff soil.

I am, Sir,

Your humble Servant,

James Beech.

Cheadle, Dec. 22, 1801.

Mr. Charles Taylor.

The above Accounts were certified by the Rev. William Eddowes to be a just statement.

The THANKS of the Society were this Session presented to Mr. SPENCER COCHRANE, of Muirfield, near Haddington, in North-Britain, for the following Communication on the CULTIVATION of SPRING WHEAT.

SIR,

IT is only a few months since I was informed that the Society of Arts, etc. were anxious to ascertain the advantages which may result from Spring-Wheat; that, in the case of an unfavourable autumn and wet winter, this mode may be practised, and be the happy means of counteractiug the bad effects of sowing as formerly, when the land was not in the wished-for state to receive the seed in autumn.

If you judge, Sir, the result of my experience for ten years can be of any use, I beg you will lay the following statement before the Society.

Since

Since the year 1790, I have been accustomed to sow a certain part of my farm with Wheat in the months of February and March, and have always succeeded both in the quantity and quality of the Grain produced; the same kind of Wheat being used by me for both the winter and spring sowings.

I ventured, in the year 1800, to sow forty-one acres of land, Scotch measure, with thirty-eight bolls of Wheat. The whole produce of good Grain was two-hundred and ninety-seven bolls, or seven and a quarter bolls per acre. The time of sowing was from the 24th of February to the 17th of March: the wet autumn and winter prevented me from getting the seed into the ground at the usual time. The whole crop was cut betwixt the 14th and 27th of September.

I remark that Wheat sown in the spring is about ten days later than that which is sown in October.

On a reclaimed marsh of five acres I sowed Wheat, the 17th of February, 1798, and reaped therefrom, the 8th of September the same year, sixty bolls, or thirty quarters, Winchester measure.

I flatter myself the Society will believe that my only motive for furnishing them with this account, is the desire of being useful to my country.

I am, SIR,

Your very obedient Servant,

SPENCER COCHRANE.

Muirfield, near Haddington,
February 25, 1802.

To Mr. CHARLES TAYLOR.

The

PAPERS

IN

CHEMISTRY.

CHEMISTRY.

The SILVER MEDAL was this Session voted to Mr. THOMAS WILLIS, of Lime-Street, London, for his Preparation of the BULBS of the HYACINTHUS NON SCRIPTUS, or COMMON BLUE-BELL, as a substitute for Gum-Arabic; the following Account of which was transmitted by him, with some of the prepared Powder.

SIR,

HAVING received a letter from Mr. Thomas Willis, relative to his discovery of the use of the Hyacinthus non scriptus, as a substitute for Gum Arabic; I request, at his desire, that you

you will lay the same before the Society of Arts, etc.

I am, SIR,

Your humble Servant,

JOHN BAKER.

Grosvenor-Street,
March, 1802.

Mr. CHARLES TAYLOR.

SIR,

I HAVE observed in the Appendix of the last Monthly Review, in their Report of the Chemical Annals, No. 115, that mention is made of a letter from Mr. Deyeux, to the authors of the Annales de Chymie; in which an account is given that a gummy substance had been discovered, by Mons. Leroux, to be contained in the Bulb of the plant called Hyacinthus non scriptus; and

and that the Reviewers only say, " This " article does not at present require any further notice than annunciation." As I know, Sir, your benevolent disposition in promoting and encouraging the Arts, the Sciences, and Manufactures of this Kingdom, I beg leave to offer the following observations on the above-mentioned article, which I think a subject proper to lay before your most excellent Society, and which I have no doubt may become of national utility.

In the year 1794, whilst collecting plants in a wood for botanical specimens, I observed that the root of the Hyacinthus non scriptus, the plant commonly called Blue-Bells, or Hare-Bells, was extremely mucilaginous; and on tasting it, I discovered only a very slight pungency. I collected a pound of the Bulbs, and, after slicing and drying them before a fire, they yielded about four ounces of powder. I thought that by keeping the powder some time, the little

little acridness might go off, as it does in the arum-root powder. I tasted it about six months after, and found it perfectly insipid. I concluded it might be rendered useful for food or nourishment, but at that time pursued the matter no further.

In the spring of 1800, gum-arabic having been a long time very dear, and likely to continue so, I thought this mucilaginous root might answer some of its purposes, for external use. I therefore procured seven pounds and a half of the Bulbs, which, when sliced and dried, produced two pounds of powder. Being soon afterwards in company with Mr. Charles Taylor, Secretary to the Society of Arts, etc. I mentioned to him that I had discovered a root which grew in great plenty in this kingdom, yielded a very strong mucilage, and which I imagined would answer the purposes of gum arabic, in some of the manufactories. He said, if I pleased, he

he would send some of it down to Manchester, to be tried by the calico-printers.

Three or four ounces of the powder were given him, and sent down there: he was informed, upon trial, that it answered the purposes of fixing the calico-printers colours, equally as well as gum-arabic; and in the same proportion, of an ounce and a half of the powder, to four ounces of the mordant. Mr. Taylor received the samples of the printed cottons on which it had been used.

On the 15th of January, 1801, I furnished Mr. Taylor with eight ounces more of the powder; but have not since heard the result.

As this root can be easily procured, and used at a less price than gum-arabic has been sold for several years past, I think it may be rendered of great utility; and the Society of Arts, etc.

by

by patronizing it, may be the means of making it a public benefit.

Care should be taken, and advice given, that the woods should not be left destitute of the roots; and it would be adviseable to offer premiums for cultivating the roots and offsets, as they are very increasing. By such means a constant supply may be had, if the roots answer the intended purposes.

I do not presume to offer any thing respecting the mode in which the Society may think proper to divulge the discovery, and promote the use of these roots; but I imagine, that if the roots are bruised and used fresh, they would answer the purpose better than when dried and powdered; and as it is now a proper time of the year for taking them up, and will continue to be so for two months, I wish that the discovery may be made known as soon as possible.

I have

I have sent you specimens both of the dried roots and powder, that they may be seen at the Society's rooms, by the calico-printers. What I have done have been scorched a little in drying; but the colour would be much better, if proper care was taken in drying them.

I am, SIR,

Your most obedient Servant,

THOMAS WILLIS.

Lime-Street,
March 17, 1802.

To JOHN BAKER, Esq.
one of the Members
of the Society of Arts,
etc.

From the trials made before the Committee with this Powder, with hot and

and cold water, from samples of the printed cotton produced which had been printed therewith instead of Gum Senegal, and from experiments made in Manchester, it appears that the Hyacinthus non scriptus may, in many cases, be found a useful substitute for Gum-Arabic.

The

The following Processes for the EDULCORATION of FISH-OIL were communicated to the Society by ROBERT DOSSIE, Esq. in the Year 1761; and a Bounty of ONE HUNDRED POUNDS was then voted to him for the same. They have lately been enquired after by different Members of the Society, and are, on this account, published in the present Volume, in their original form.

Explanation of the Principles on which the PURIFICATION *of* FISH-OIL *may be performed, and of the Uses to which it is applicable.*

THAT the fetid smell of Fish-oil is chiefly owing to putrefaction, it is unnecessary to show; but though this be the principal cause, there is another likewise, which is, ustion or burning the oil, occasioned by the strong heat em-

ployed for the extracting it from the blubber of the larger fish, and which produces a strong empyreumatic scent that is not always to be equally removed by the same means as the putrid smell, but remains sometimes very prevalent after that is taken away.

In order to the perfect Edulcoration of Oils, there are consequently two kinds of fœtor or stink to be removed, viz. the putrid, and the empyreumatic; and the same means do not always equally avail against both.

The putrid smell of Fish-oil is of two kinds; the rancid, which is peculiar to oils; and the common putrid smell, which is the general effect of the putrefaction of animal fluids, or of the vascular solids, when commixed with aqueous fluids.

Fish-oil has not only rancidity, or the first kind of putrid smells peculiar to oils, but also the second or general kinds; as the oil, for the most part, is commixed

with

with the gelatinous humour common to all animals, and some kinds with a proportion of the bile likewise; and those humours putrifying combine their putrid scent with the rancidity of the oil, and, in cases where great heat has been used, with that and the empyreuma also.

The reason of the presence of the gelatinous fluid in Fish-oil is this: that the blubber, which consists partly of adipose vesicles, and partly of the membrana cellulosa, which contains the gelatinous fluid, is, for the most part, kept a considerable time before the oil is separated from it, either from the want of convenient opportunities to extract the oil, or in order to the obtaining a larger proportion; as the putrid effervescence which then comes on, rupturing the vesicles, makes the blubber yield a greater quantity of oil than could be extracted before such change was produced; and the vesicles of the tela cellulosa, containing the gelatinous matter,

being also burst from the same cause, such matter being then rendered saponaceous by the putrefaction, a part of it mixes intimately with the oil, and constitutes it a compound of the proper oleaginous parts and this heterogeneous fluid.

The presence of the bile in Fish-oil is occasioned by its being, in many cases, extracted from the liver of the fish; which is not to be so profitably done by other means as by putrefaction; and the bile being consequently discharged, together with the oil from the vessels of the liver containing them, combines with it, both from the original saponaceous property of bile, and from that which it acquires by putrefaction.

This holds good particularly of the cod-oil, or common train, brought from Newfoundland; which, from its high yellow colour, viscid consistence, and repugnance to burning well in lamps, manifests sensibly the presence of bile

and

and the gelatinous fluid; which latter, by the saponaceous power of the bile, is commixed in a greater proportion in this than in any other kind of fish-oil.

A tendency to putrify, or at most but in an extremely slow manner, is not an absolute property of perfect oils in a simple or pure state; but it is a relative property dependant upon their accidental contact or commixture with the aqueous fluid. This is evident from the case of oils concreted into a sebaceous form; which being perfectly oleaginous and uncombined with any water, except such as enters into their component parts will not putrify unless water, or something containing it, is brought in contact with them. But the fluid animal, and most vegetable oils, being compounded of perfect oils with other mixed substances, either sub-oleaginous or gelatinous, have always a putrescence *per se*, or tendency to putrify, without further admixture of aqueous moisture.

This commixture of heterogeneous matter in Fish-oil, particularly of the gelatinous fluid and bile, gives rise to a further principle of purification than *simple Edulcoration*, or the removing the fœtor; for the presence of such humours in the oil renders it subject to a second putrescence *per se*, supposing the first corrected; makes it unfit for the purpose of the woollen manufacture, as the heat through which this is in some cases employed, causes this matter to contract a most disagreeable empyreuma. It also prevents its burning in lamps, as well from its viscidity as from the repugnance which the presence of water gives to all oleaginous matter. It is therefore necessary to free the oil from this heterogeneous matter; after which it can be subject only to the rancid putrescence, or that which is proper to oils as such.

The substances which have been or may be applied to the removing or preventing

venting the effects of putrescence, are, acids, alkalies, metallic calces, neutral salts, ethereal and essential oils, vinous spirits, water, and air. With respect to acids, though they may be applied with effect to the removal or prevention of putrefaction in mixed animal and vegetable substances, yet they have not the same efficacy when employed in the case of oils; for in a small proportion, without the subsequent aid of alkalies, they rather increase than diminish the fœtor, and in a large proportion they coagulate the oils, and change their other properties as well as their consistence. Though they might therefore be employed with the assistance of alkalies, yet requiring a more expensive and complex process, and not being moreover necessary, as the same end may be obtained by the use of alkalies only, they may be deemed improper for the purification of animal oils for commercial purposes. Alkaline substances, both salts and earths, are

the most powerful instruments in the edulcoration of oils; but as their action on putrid oils, and the method of applying them to this end, are not the same in both, it is proper to consider them distinctly.

Of alkaline salts it is the fixed kind only which are proper to be used for the edulcoration of oils. Fixed alkaline salts, in a dissolved state, being commixed with putrifying animal substances, appear to combine with the putrid matter, and mixing with some of the principles, form instantly volatile alkaline salts. On the less putrid they seem to act, after their combination, by an acceleration of the putrescent action, till they attain the degree which produces volatile salts. This is evident by the sensible putrid ferment and smell which appear after their commixture; but which gradually abating, the oil is rendered sweeter, much lighter-coloured, and thinner.

Their

Their great use in the edulcoration of Fish-oil arises, therefore, from their converting such parts of the gelatinous fluid and bile as are highly putrified, instantly into volatile salts, and causing a rapid putrefaction of the other parts; by which means the oil is freed from them by their dissipation. They do not, however, equally act on the parts of the oil on which the empyreumatic scent depends, unless by the assistance of heat; for when they are commixed with the oils without heat, in proportion as the putrid smell diminishes, that becomes more sensibly prevalent. The ultimate action of lixiviate salts on animal oils, except with respect to the empyreuma, seems to be the same either with or without the medium of heat; for the same urinous and putrid smell, gradual diminution of the colour, and fetid scent, happens in one case as in the other, except with regard to the acceleration of the changes; and such

salts,

salts, where the purification is required to be made in a great degree, are a necessary means, as they are more effectual than any other substance that can be employed.

The use of lixiviate salts alone is not, however, the most expedient method that can be pursued for the edulcoration of oils, for several reasons. If they be used alone, cold, in the requisite proportions, they coagulate a considerable part of the oil, which will not again separate from them under a very great length of time; and when they have destroyed the putrid scent, a strong bitter empyreumatic smell remains. The same inconvenience, with relation to the coagulation of part of the oil, results when they are used alone with heat. The super-addition of common salt, (which resolves the coagulum and counteracts the saponaceous power of the lixiviate salt, by which the oil and water are made to combine) is therefore

fore necessary; and the expence arising from the larger proportion of lixiviate salt, requires it to be employed if no other alkali be taken in aid, and renders the junction of alkaline earths with it extremely proper in the edulcoration of oils for commercial uses. Lime has also an edulcorative power on animal oils; but it has also so strong a coagulative action, that the addition of a large proportion of alkaline salts becomes, when it is used, necessary to reduce the concreted oil to a fluid state; and therefore this substance alone is not proper for that purpose. The combination of lixiviate salt with lime, or the solution commonly called soap-lye, has an effectual edulcorative action on fetid oils; but it makes a troublesome coagulation of part of the oil, if no common salt be employed, and must be used in such large proportion, if no alkaline earth be added, as renders the method too expensive.

Lime

Lime has a power of combining with and absorbing the putrid parts of the gelatinous fluid and bile, when commixed with oil; and effects, either with or without heat, a considerable edulcoration of fetid oils; but it combines so strongly with them, either cold or hot, that the separation is difficult to be effected, even with the addition of brine; and the oil, when a large proportion of it is used, can scarcely be at all brought from its concreted to a fluid state, but by an equivalent large proportion of lixiviate salt: the use of lime therefore, alone, is improper, or even in a great proportion with other ingredients. But when only a lesser degree of edulcoration is required, a moderate quantity, conjoined with an equal or greater weight of chalk, which assists its separation from the oil, may, on account of its great cheapness, be employed very advantageously: it will in this case admit of precipitation from the

the oil by the addition of brine. It may be also expediently used, when lixiviate salt is employed with heat for the most perfect purification of oils; for it will in that case give room for the diminishing of the quantity of lixiviate salt, though the proportion be nevertheless so restrained as not to exceed what the proportion of lixiviate salt (just requisite for the edulcoration) can separate from the oil.

Chalk has an absorbing power similar to lime, but in a less degree on the putrid substance of oil; it does not, however, combine so strongly with the oil as to resist separation in the same manner, and is therefore very proper to be conjoined either with lixiviate salts or lime, as it renders a less quantity of either sufficient, and indeed contributes to the separation of the oil from them.

Magnesia alba or the alkaline earth which is the basis of the sal catharticus, and the singular earth which is the basis

of

of alum, both have an edulcorating power on fetid oils; but, like lime, have too strong an attraction with them to be separated so as to admit of the reduction of the oil from the concreted state to which they reduce it; and therefore, as they are not superior in efficacy to lime and chalk, but much dearer or more difficult to be obtained, they may be rejected from the number of ingredients that are proper for the purifying of oils, with a view to commercial advantages.

Sea-salt has an antiseptic power on the mixed solid parts of animals; but used alone, or dissolved in water, it does not appear to lessen the putrid fœtor of oils, but on the contrary rather increases it. If, after their commixture with it, they are subjected to heat, it rather depraves than improves the oils; but though by its own immediate action on them it conduces so little to the edulcoration of oils, yet it is a medium

for

for the separation of water and the alkaline substances requisite to be employed to that end. It is of great utility in the edulcorative processes: for when alkaline salts or earths combine with the water necessary to their action on the oils, or themselves form coagulums or corrections with it, a solution of salt will loosen the bond and dissolve the close union; so that the oil being separated will float on the aqueous fluid, while the earth, if any be in the mixture, will be precipitated and sink close together to the bottom of the containing vessel.

Sal catharticus, glauber salt, nitrum vitriolatum, tartar, and other neutral salts, though they counteract putrefaction in the mixed or solid parts of animals, seem to have little effect on oils with respect to their edulcoration, and cannot therefore be ranked amongst the substances proper to be used for that purpose.

Lead

Lead reduced to the state of a calx, either in the form of minium or litharge, has a strong edulcorative power on fetid oils, and is indeed applied to that end, with respect to one kind of vegetable oil, for a very bad purpose, considering its malignant qualities on the human body.

In the case of train-oil, which will scarcely ever be considered among the esculent kinds in this country, the same objection against its use would not lie; and employed either with or without heat, it is a powerful absorbent both of the putrid and empyreumatic parts that occasion the fœtor.

As however there may be some prejudice against its use, even in any way, and as it is not absolutely necessary, I have not given it a place among the ingredients of the processes I recommend.

The ochrous earth of iron, commonly called red ochre, has an absorbing power

on

on the putrid parts of oil, but combines so strongly, that the separation is tedious even with the addition of brine; if, nevertheless, it is added when chalk and lime have been some time commixed with the oil, as in process the first, it will promote the edulcorative intention, and will subside along with them; and, as it has some advantage without increasing the expence, unless in the most inconsiderable degree, its use may be expediently admitted in that process.

Essential and ethereal oils are applicable to the prevention of putrefaction in the mixed and solid parts of vegetables, but are not so to the edulcoration of fetid oils; and if they had the desired effect, they would not, on account of their price, answer the commercial end, unless the due effect was produced by adding them to the oils in a very small quantity.

The same holds good of spirits of wine as of essential and ethereal oils, both with respect to their efficacy and the expense.

Water has an edulcorative action on fetid oils, by carrying off the most putrid parts of the gelatinous fluid or bile, in which, as was above explained, the principal fœtor resides, if the quantity added be large, and an intimate commixture be made of them by stirring them together for a considerable time: this only partially removing those heterogeneous putrescent substances, the remaining part soon acquires the same state and the oil again grows fetid, though not to the same degree as before.

Water is, however, a necessary medium for the action of salts and the separation of alkaline earths and calces of metals, when they are employed for the edulcoration of oils, as will appear from a consideration of my processes.

Air edulcorates oil by carrying off the most putrid parts, which are necessarily extremely volatile. It may be made to act on them either by simple exposure of them to it with a large extent of surface, or by forcing it through them by means

means of ventilators as has been practised by some dealers; but is now, I believe, neglected on account of their finding the improvement of oils by it not adequate to the trouble, as the gelatinous matter and bile, not reduced to a certain degree of putrefaction, being left behind, putrify again to nearly the same degree as before.

It appears from these several observations, that the cheapest ingredients which can be used for the edulcoration of Train-oils, are lime and chalk, which may, with the addition of a proper quantity of solution of sea-salt or brine, be made to procure a separation of them from the oils, according to process the first, so as to answer for some purposes; that the lixiviate salt is the most powerful purifier of oils, and, with the assistance of chalk and brine, will, without heat, according to process the second, effect a very considerable degree of edulcoration; and that lixiviate

salt used with heat, with the addition of lime and chalk, to save a part of the quantity which would otherwise be necessary, and of brine to procure a quick separation, will perform an edulcoration sufficient for all commercial purposes, according to process the third; but that calcined lead and the ochrous earth of iron may, perhaps, be applied in some cases with advantage, where the oil is not designed for esculent use.

PROCESS THE FIRST.

For purifying Fish-oil in a moderate degree, and at a very little expense.

TAKE an ounce of chalk in powder, and half an ounce of lime slacked by exposure to the air; put them into a gallon of stinking oil, and, having mixed them well together by stirring, add half a pint of water, and mix that also with them by the same means. When they have stood an hour or two, repeat the stirring, and continue the same treatment at convenient intervals for two or three days; after which, superadd a pint and a half of water, in which an ounce of salt is dissolved, and mix them as the other ingredients, repeating the stirring, as before, for a day or two. Let the whole then stand at rest, and the water will sink below the oil, and the chalk subside in it to the

bottom of the vessel. The oil will become clear, be of a lighter colour, and have considerably less smell, but will not be purified in a manner equal to what is effected by the other processes below given; though, as this is done with the expense of only one ounce of salt, it may be practised advantageously for many purposes, especially as a preparation for the next method, the operation of which will be thereby facilitated.

PROCESS THE SECOND.

To purify, to a great degree, Fish-oil without Heat.

Take a gallon of crude stinking oil, or rather such as has been prepared as above mentioned, and add to it an ounce of powdered chalk; stir them well together several times, as in the preceding process; and after they have been mixed some hours or a whole day, add

add an ounce of pearl-ashes, dissolved in four ounces of water, and repeat the stirring as before. After they have been so treated for some hours, put in a pint of water, in which two ounces of salt are dissolved, and proceed as before: the oil and brine will separate on standing some days, and the oil will be greatly improved both in smell and colour. Where a greater purity is required, the quantity of pearl-ashes must be increased, and the time before the addition of the salt and water prolonged.

If the same operation is repeated several times, diminishing each time the quantity of ingredients one half, the oil may be brought to a very light colour, and rendered equally sweet in smell with the common spermaceti oil.

By this process the cod-oil may be made to burn; and, when it is so putrid as not to be fit for any use, either alone or mixed, it may be so corrected by the first part of the process, as to be

equal to that commonly sold: but where this process is practised in the case of such putrid oil, use half an ounce of chalk and half an ounce of lime.

PROCESS THE THIRD.

To purify Fish-oil with the assistance of Heat, where the greatest purity is required, and particularly for the Woollen Manufacture.

Take a gallon of crude stinking oil, and mix with it a quarter of an ounce of powdered chalk, a quarter of an ounce of lime, slacked in the air, and half a pint of water; stir them together; and when they have stood some hours, add a pint of water and two ounces of pearl-ashes, and place them over a fire that will just keep them simmering, till the oil appears of a light amber colour, and has lost all smell except a hot, greasy, soap-like scent. Then superadd half

half a pint of water in which an ounce of salt has been dissolved; and having boiled them half an hour, pour them into a proper vessel, and let them stand till the separation of the oil, water, and lime be made, as in the preceding process. Where this operation is performed to prepare oil for the Woollen Manufacture, the salt may be omitted; but the separation of the lime from the oil will be slower, and a longer boiling will be necessary.

If the oil be required yet more pure, treat it, after it is separated from the water, &c. according to the second process, with an ounce of chalk, a quarter of an ounce of pearl-ashes, and half an ounce of salt.

Observations on Process the First.

This process may be performed on any kind of fish or seal-oil that is putrid and stinking, and will improve it in smell, and generally render the colour lighter,

lighter, if previously dark and brown: it will also conduce to render these oils fitter for burning, which are, in their crude state, faulty in that point; but it will not meliorate them to the full degree they admit of even without heat, and should therefore be practised when only a moderate improvement is required.

Secondly. When the oil is taken off from the dregs and brine, the dregs which swim on the brine should be taken off it also, and put into another vessel of a deep form; and on standing, particularly if fresh water be added and stirred with them, nearly the whole remaining part of the oil will separate from the foulness; or, to save this trouble, the dregs, when taken off, may be put to any future quantity of oil that is to be edulcorated by this method, which will answer the same purpose.

Observations

Observations on Process the Third.

First.—This is most advantageously performed on Train-oil, called vicious whale-oil; and the more putrid and foul it may be, the greater will be the proportionable improvement, especially if there be no mixture of the other kinds of Fish-oils, particularly the seal, which do not admit of being edulcorated perfectly by means of heat, but require other methods: but when the vicious oil is pure from admixture of others, however stinking it may be, the bad smell will be removed by this process duly executed, and the brown colour changed to a very light amber; and these qualities will be much more permanent in this than in any crude oil, as it will not, from the degree of purity to which it is brought, be subject to putrify again under a great length of time, whether it be kept open or in close vessels.

The

The oil in this state will burn away without leaving the least remains of foulness in the lamp; and, being rendered more fluid than before, will go further, when used in the Woollen Manufacture, than any other kind, and will be much more easily scoured from the wool.

If nevertheless there be any branches of the Woollen Manufacture which require the use of a more thick and unctuous oil, this may be rendered so by the addition of a proper quantity of tallow or fat, of which a certain proportion will perfectly incorporate with the oil, the fluidity and transparency being still preserved, as well as all the other qualities that render it suitable to the intended purpose. This may be most beneficially done by adding a proper quantity of the refuse grease of families, commonly called *kitchen-stuff*, which being put to the oil, when moderately heated, will immediately dissolve in it, and let fall also its impurities or foulness to the bottom

bottom of the vessel, and render the purified admixture a considerable saving to the manufacturers.

Secondly. The different qualities and dispositions of different parcels of vicious oil with respect to edulcoration, render various proportions necessary of the ingredients to be used. The quantities stated in the above process are the least which will effect the end in general, and frequently greater will be required; but this may always be first tried; and if it be found, after six or eight hours simmering of the mixture, that no gradual improvement is making in the smell and colour, but that the oil continues the same in those particulars, and remains also mixed with the chalk and lime, and in a thick turbid state, a fourth or third part of the first quantity of pearl-ashes should be added, and the simmering continued till the oil be perfect. As the quantity of the water is lessened by the evaporation, it is necessary to make fresh additions

additions from time to time, that there may be always nearly the original proportion.

Thirdly. If it be inconvenient to give the whole time of boiling at once, the fire may be suffered to go out and be re-kindled at any distance of time; and if, in such case, a small proportion of pearl-ashes dissolved in water be added, and the mixture several times stirred betwixt the times of boiling, it will facilitate the operation. The time of boiling may be also much shortened, if the chalk, lime, and pearl-ashes, be added for some days before, and the mixture frequently stirred.

PROCESS THE FOURTH,

Which may be practised alone, instead of Process the First, as it will edulcorate and purify Fish-oil to a considerable degree, so as to answer most purposes, and for Process the Third, when the whole is performed.

Take a gallon of crude stinking oil, and put to it a pint of water poured off from two ounces of lime slacked in the air; let them stand together, and stir them up several times for the first twenty-four hours; then let them stand a day, and the lime-water will sink below the oil, which must be carefully separated from them. Take this oil, if not sufficiently purified for your purpose, and treat it as directed in Process the Third, diminishing the quantity of pearl-ashes to one ounce, and omitting the lime and chalk.

ROBERT DOSSIE. *

* The Dregs, remaining after the sundry processes above mentioned, will form an excellent Manure; as has been since noticed in Dr. Hunter's Georgical Essays.

PAPERS

IN

MECHANICKS.

MECHANICKS.

The Sum of TWENTY GUINEAS was this Session voted as a Bounty to Mr. JOHN WEBB, of Dorrington-Street, London, for his Improvement of a Gun-Lock, which is likely to prove of considerable advantage to Society, by preventing the numerous accidents that arise from the unexpected discharge of Fire-Arms; a Plate and Description of which lock are annexed, and a complete Model reserved in the Society's Repository.

SIR,

I HAVE taken the liberty of sending to the Society an invention of mine, to prevent the accidents which frequently attend the use of Fire-arms, and which may be applied to the Gun-locks now in common use. It is con-

trived on such a principle, that when it is on full cock, and the trigger pulled in the common manner, it returns to the half cock only, unless, at the same time that the trigger is pulled, the pressure of the thumb is applied on a spring placed upon the butt or stock of the gun; in which case it gives fire in the usual manner. The intent of this invention is to guard against the casualties which arise when Fire-arms are left loaded, or the misfortunes which frequently happen from twigs of trees or bushes catching the trigger when sportsmen are passing through hedges.

I hope it will meet the approbation and encouragement of the Society, and am,

SIR,

Your humble Servant,

JOHN WEBB.

To Mr. CHARLES TAYLOR.

Mr. John Webb's Gun Lock for preventing Accidents in the use of Fire Arms.

Fig. 1.

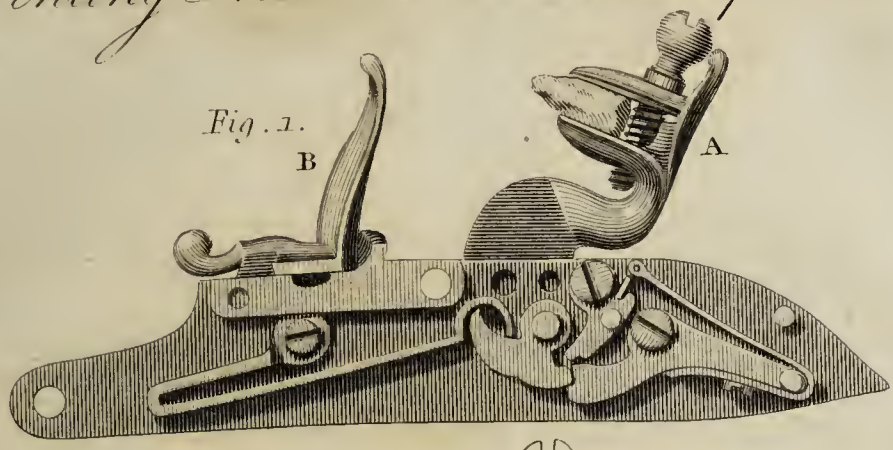


Fig. 2.

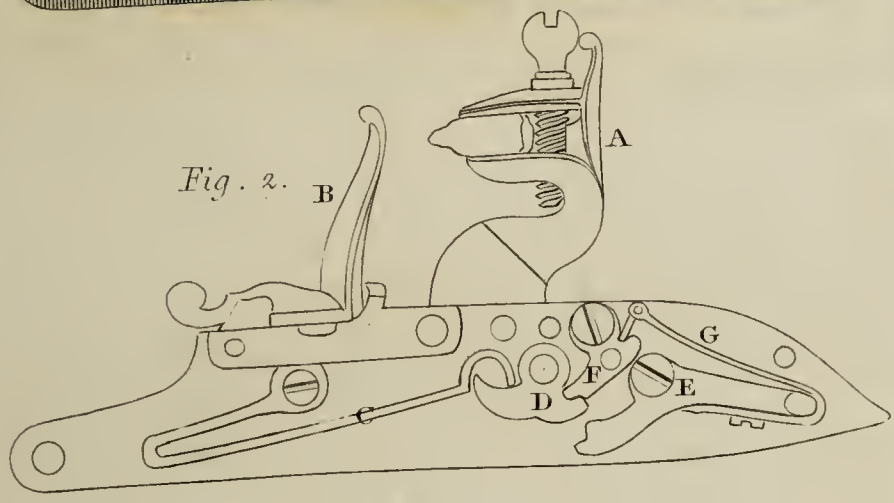


Fig. 3.

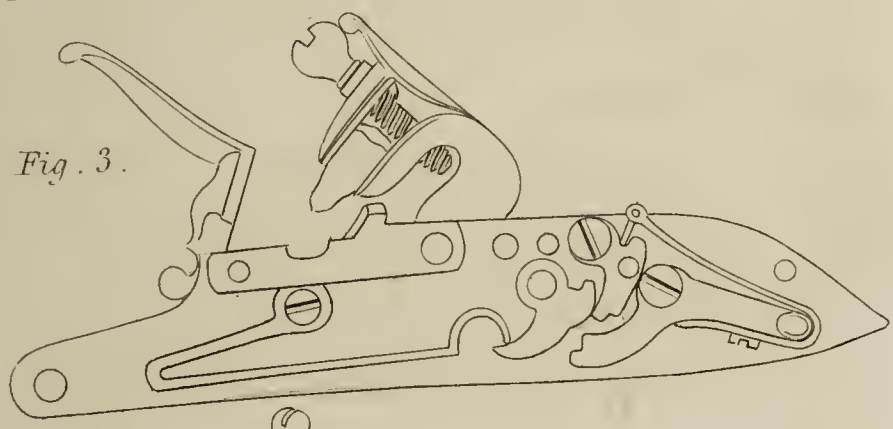


Fig. 4.

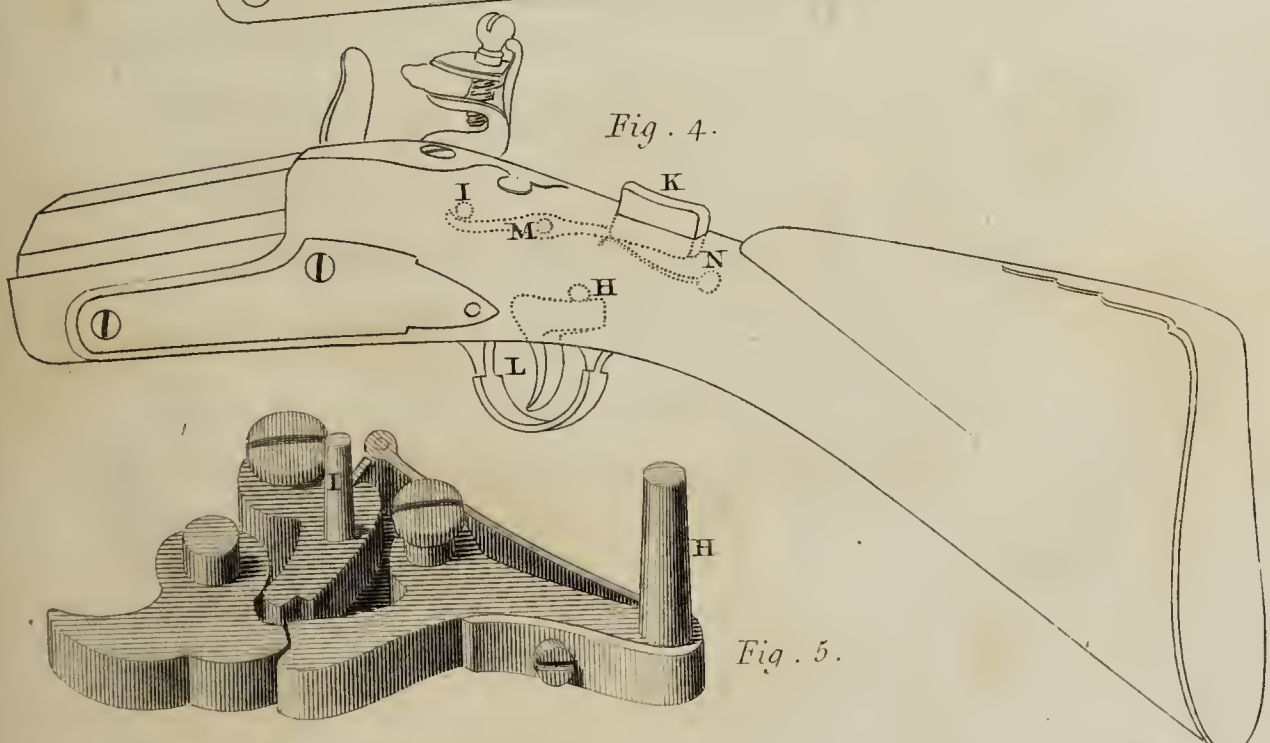


Fig. 5.

Engraved by W. Lowry.

by J. Malton.

DESCRIPTION *of* Mr. JOHN WEBB's *Gun-Lock, Plate II. Fig.* 1, 2, 3, 4, 5. *The Letters of the several Figures correspond together in the general Description.*

A is the cock—B, the hammer—C, the main spring—D, the tumbler—E, the large sear—F, the small sear—G, the sear spring—H, the shank or arm of the large sear—I, the shank or arm of the small sear—K, the thumb-piece—L, the trigger—M, the lever of the thumb-piece—N, the spring which holds the thumb-piece up, when not pressed upon by the thumb.

Fig. 1, is an interior view of the lock at full cock.

Fig. 2.—The same lock at half cock.

Fig. 3.—The lock when down.

Fig. 4.—The lock fixed in the gun-stock, in order to show the thumb-piece

K and the trigger L, with their mode of action. When the gun is held cocked in the usual manner, ready to fire, and the trigger L is pulled by the finger, the thumb, being pressed at the same time on the piece K, raises, by means of the lever M, moveable on a pin in its centre, the shank I of the small sear, and admits the cock to give fire as in the common way; whereas, if only the trigger L is pulled, the lock stops at the half-cock I; further motion being prevented by a notch in the small sear. A spring, N, screwed to the stock, returns the thumb-piece to its place, when the thumb is taken off.

Fig. 5 shows, on a larger scale, the construction of the tumbler, large and small sears, the sear-spring, and the manner in which they rise out of the bents of the tumbler.

The

The SILVER MEDAL was this Session presented to Mr. RICHARD KNIGHT, Ironmonger, of Foster-lane, Cheapside, for his method of BREAKING-UP LOGS of WOOD, for the purposes of Fuel, by blasting them with Gunpowder. The following Accounts and Certificates were received from him, a Drawing of the Apparatus is hereunto annexed, and the Implements are placed in the Society's Repository.

SIR,

I HAVE frequently observed the great difficulty, labour, and loss of time experienced in Breaking-up Logs of Wood, particularly for the purpose of fuel; such as the stumps and roots of large trees, which remain after the felling of timber, many of which, especially such as consist of the harder and

more knotty kind, as oaks, elms, yews, etc. are frequently left to rot in the ground, in order to avoid the necessary expense of breaking them to pieces in the common way, which is generally effected by the axe, and driving a succession of iron wedges with a sledge hammer; a laborious and tedious process. Sometimes gunpowder is used, by setting a blast in a similar way to that in mines or stone-quarries. This method, though less laborious than the former, is tedious, is attended with several difficulties, and requires considerable experience and dexterity, or the plug will be more frequently blown out than the block rent by the explosion. With a view, therefore, to obviate these difficulties, I have constructed an instrument, a sketch and description of which I now inclose for your approbation. The simplicity of its construction and application is such as almost to preclude an idea of its originality; but as it has hitherto

hitherto appeared entirely new to all my acquaintance, and as I do not know that any thing of the kind has ever before been presented to the Public, I am induced to think it may not be unacceptable; and should it appear to you an object worthy the attention of the Society of Arts, I shall be happy in making it public through a channel so highly respectable; and will, immediately on being favoured with your opinion, transmit to the Society a complete instrument with the necessary appendages, and a more minute description of its mode of application.

I am, SIR,

Your obedient humble Servant,

RICHARD KNIGHT.

Foster-lane,
March 16, 1802.

Mr. CHARLES TAYLOR.

The

The inclosed Drawing represents the Instrument, which consists simply of a screw A, with a small hole drilled through its centre. The head of the screw is formed into two strong horns, for the more ready admission of the lever by which it is to be turned.

B represents a wire, for the purpose of occasionally clearing the touch-hole. When a block of wood is to be broken, a hole is to be bored with an auger of a proper depth, and a charge of gunpowder introduced. The screw is to be turned into the hole, till it nearly touches the powder; a quick-match is then to be put down the touch-hole till it reaches the charge. The piece of quick-match is about eighteen inches in length, which affords the operator an opportunity of retiring, after lighting it, to a place of safety.

The quick-match is made by steeping a roll of twine or linen thread in a solution of saltpetre.

DESCRIPTION *of the Engraving of* Mr. RICHARD KNIGHT's *Method of Blasting Logs of Wood. Plate III.—Fig.* 1.

SIR,

AS it may probably be a greater satisfaction to the Society to see the Instrument itself (a sketch of which I sent you last week, for the purpose of rending timber, logs of wood, etc, etc.) I now inclose a complete one, together with the necessary apparatus for its application, and of which I solicit the Society's acceptance.

The following are the Articles inclosed.

A, the rending or blowing screw, with a wire B, for the purpose of occasionally clearing the touch-hole, previous to the introduction of the quick-match.

C, an

C, an auger proper to bore holes, to receive the charge of the screw.

D, a gouge, to make an entrance for the augur.

E, a lever, to wind the screw into the wood, with a leather thong F attached to it, in order to fasten it occasionally to the screw, to prevent its being lost, in case it should be thrown out when the block is burst open; a circumstance which does not often occur: for in all my experiments, when the wood has been tolerably sound, I have always found the screw left fixed in one side of the divided mass.

A roll of twine is to be steeped in a solution of nitre, for the purpose of a quick-match, or train, to discharge the powder, by thrusting a piece thereof down the touch-hole, after taking out the wire B.

The first that was made was for J. Lloyd, Esq. of St. Asaph, the late Member

Member for Flint, who, having a great quantity of timber on his estate, considers it a considerable acquisition; and at Overton-Hall, last summer, spoke so favourably of it, in my presence, to Sir Joseph Banks, that he immediately sent for his smith, and requested I would give him the necessary instructions for making one; but as I left that part of Derbyshire soon after, I had not an opportunity of seeing it finished. Since my return home, I have had several made, similar to that which I now present to the Society, which are better finished, and have sharper threads than smiths in general have an opportunity of giving them. Should the Society want farther explanation, I shall very readily wait upon them, if required, for that purpose, and remain,

Your very humble Servant,

RICHARD KNIGHT.

Foster-lane,
March 24, 1802.

Mr. CHARLES TAYLOR.

DEAR

Dear Sir,

AFTER you left us last autumn, at Sir Joseph Banks's, his smith, who is a remarkably good workman, bestowed much needless time and trouble in making a blasting-screw; for he finished it in the highest style of polish, and, I think, made the thread of the worm too fine, or at least finer than was needful. However, it answered most completely, and very much to Sir Joseph's satisfaction, who lamented he had not seen such a contrivance many years ago, when a relation of his used to amuse himself with splitting the roots of trees, etc. in the common way. I have used the *Blasting-screw*, for so I shall call it, all the last and preceding winter, with the greatest success, and have gained many loads of fuel, which otherwise would have been suffered to rot, as the expense and labour in clearing the roots in the ordinary way renders the fuel

so

so procured too expensive; and since I have had the screw, I have observed some hundreds of roots in a rotting state in other places, from the want of knowing that there was such a contrivance as the screw. I think you would serve the public in no small degree, by devising some method of making its use known to the world.

When I was at Overton, some pieces of very tough, knotty, close-grained oak were picked from the timber-heap, for the use of the Gregory lead-mine, by Sir Joseph Banks's direction, and the screw severed some pieces four or five feet in length, and nine or ten in diameter, throwing them some feet asunder, to the surprise of the miners, who were assembled on the mine-bank. Sir Joseph took the screw with him to Revesby-Abby, in Lincolnshire, where, I understand, he had some large roots, that had lain by many years as useless; and I dare say he will give you a good account,

account, and bear testimony to the utility of the invention. We have used it without a single accident; but my neighbour, Lord Kirkwall, having procured one to be made by that which I had from you, one of his servants, in his Lordship's absence, I presume, put too much powder into the hole, and the screw was blown as high as a one-pair-of-stairs window, and passed through it into an apartment where a person then happened to be, but without any farther mischief than the loss of a pane of glass. Any one who uses the instrument will soon learn what depth of screw will be sufficient to split any root in proportion to its strength, taking care that the screw has sufficient hold to resist the force of the gunpowder, before the root is cleft. I think much powder may be saved by using a cotton match, impregnated by a solution of saltpetre, or any of the combustible matters generally made use of in fire-works; and by the

use

use of the cotton the hole through the screw may be lessened, which will add to the action of the confined powder; though a straw filled with powder, in the manner in which the miners use it, answers very well. Should any one be timid in using the screw, a chain or rope may easily be attached to the screw, and that fixed to any log, or fastened to a stake driven into the ground. If wood is rotten, the screw cannot act. I assure you, that when I go abroad, I constantly see great quantities of roots in a rotten state, about almost every farm-house, which would not be the case if the utility of the instrument were made public.

I am

Your much-obliged Friend

And humble Servant,

J. Lloyd.

Wygfair,
March 26, 1802.

To Mr. Richard Knight.

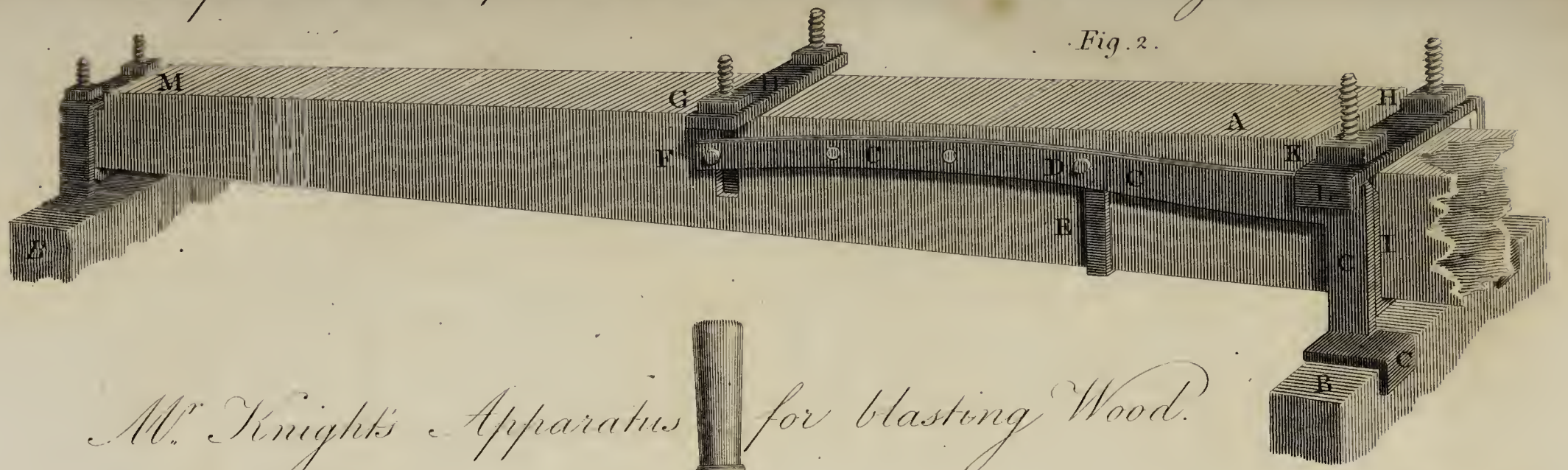
A Bounty of TEN GUINEAS was this Session voted to Mr. JAMES WOART, of Fulham, for his Invention of a METHOD TO SECURE FROM DANGER TIMBERS or GIRDERS, injured by the Dry-rot, or by Time. Models on his plan are reserved in the Society's Repository for the inspection of the Public. Descriptions and two Plates of them are here annexed.

SIR,

THAT part of the Model I have sent herewith, which has moveable Iron Levers or Braces, *Plate III. Fig. 2*, represents the method I have employed, at the House of Hennege Legg, Esq. at Putney, in Surry, to support the Girders or Beams where their ends or bearings were entirely destroyed. Had the iron braces not been put in execution, new Girders must have been inevitably introduced, for reasons hereafter noticed. The bearing is not less than twenty-nine feet. The roof must have been

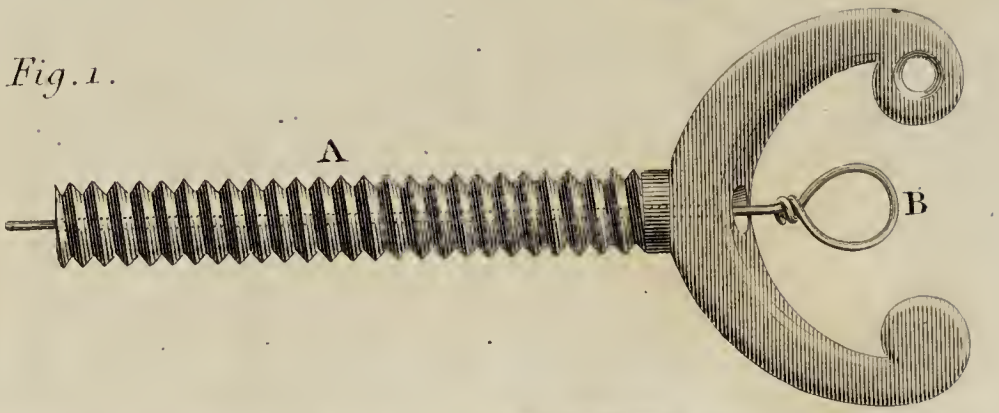
Perspective View of Mr. Woark's method of supporting Timbers.

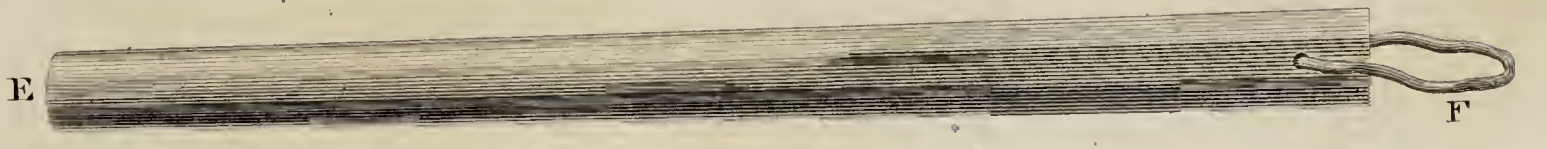
Fig. 2.



Mr. Knight's Apparatus for blasting Wood.

Fig. 1.





J. Mallon del.

Lowry scalp.

been completely taken off, owing to the gutter-plate being placed across the girders, and the roof a double one.

The ceiling of the drawing-room, which is immediately under the Girders, must also have been destroyed.

This ceiling is highly ornamented, and supposed to be in value five hundred pounds, to which sum if the expense of taking off the roof, etc. is added, it would have cost eight hundred pounds to have reinstated the work; whereas, I believe, that the iron braces and workmanship in effecting this business, on my plan, did not amount to twenty pounds, for securing the four ends of the Girders, the ceiling, and the roof.

If my plan is approved of by the Society, I trust to their liberality for reward. I am, SIR,

Your humble Servant,

JAMES WOART.

Fulham,
Nov. 25, 1801.

Mr. CHARLES TAYLOR.

DESCRIPTION *of the Engravings of Mr.* JAMES WOART's *Inventions for securing Beams of Timber, decayed by time or injured by the dry rot.*

Plate III. Fig. 2; *and Plate IV. Fig.* 1, 2, 3, 4, 5, 6, 7.

Where the ends of the girder are decayed by time, or injured by the dry rot, they are often taken out, and new ones put in their place, at a great expense; and if the dry rot is in the walls, the ends of the new girder will be in danger of it again: such was the case at Eltham, in Kent, where in one house there were three new girders to one floor in the space of twenty years; whereas my method will be found infallible, executed at much less expense, and not subject to the dry rot, because the end of the girder may be cut off clear from the wall; and if an air grate is put on the outside, so as to admit air

to

to the end of the girder, it will remain safe from injury.

Plate III. Fig. 2.—A, shews the end of the decayed girder, with the braces applied upon it.

BB, the templets or wall-plates on which the Girder rests.

CCCC, one of the iron levers for raising and supporting the girder (there being a similar one on the opposite side). This lever is moveable on a pin D, which comes through a hole in the lever, distant about two feet from the end of the girder. This pin forms part of a coller E bedded in the girder. The lever is six feet long, three inches wide, and three fourths of an inch thick, and extends from the wall-plate along the side of the girder.

The extremity of the lever is moveable on another pin F, projecting through it from an upright iron G, bedded in the side of the girder, and carrying a nut and screw, which act on a cross plate H, through which the upright iron passes.

At the other end of the lever, next the templet, is an iron collar I, bedded in the girder, which collar may be raised or lowered at pleasure, by means of the nut and screw K, forming part of it; and by aid of the cap-plate L, which presses upon the lever, and also clasps it to the girder by its bend at L.

As the *Plate III. Fig.* 2, shows only one side of the girder, and, as has been before observed, there being also a similar lever on the opposite side of the girder, their separate parts, method of connecting them, and their mode of action, are more fully explained in *Plate IV. Fig.* 1, 2, 3, where the same letters are made use of to point out the several parts.

Fig. 1.—E, shows the whole of the collar to be bedded in the side and bottom of the girder, and the pins DD, on which the two levers are moveable.

Fig. 2.—The cap-plate H, the two upright irons GG, with their nuts and screws,

screws, which act upon the extremities of the two levers by means of their pins FF.

Fig. 3.—The collar I, on which that end of the girder next the templet rests, the sides of which collar are bedded in the girder. C C are the claws or bended legs of the two levers which go into the templet. L is the cap-plate, KK are the nuts and screws.

At Mr. Legg's house, where the levers above mentioned were applied, the beams of the roof were so decayed that the roof was in imminent danger, the bearings were entirely rotten, and the beams were sunk three fourths of an inch, and pressing against the wall for support; if there had not been a large cornice underneath, supported by brackets, the whole roof must have fallen.

To put them in order, I first put shores or supports under each end of the two beams, on which the double roof lay, and then forced the four shores at once,

for the security of the roof, the work, and men. The iron levers, C, were then prepared, let into the templet, and fixed on each side of the beam, on the pins D, projecting from the collar E, bedded in the beam, about two feet from its end. When the whole apparatus was ready, on screwing the nuts on the upright irons G, at the extremity of the levers, the beam was raised to its proper height with great ease, although it was supposed there was above two tons weight on each beam, on account of the lead gutter, and gutter-beam betwixt the double roof, and the rich ornamented ceiling attached to the joice, which was not the least destroyed except where the iron-collar E was fixed, which was put up from the under side by cutting the ceiling the width of the collar. These beams were so decayed, and so hollow, that the common method of bolting plank on each side of the beam would not have been safe; and if it could have been

been executed, the new planks would have been subject to the dry rot, and the roof still in danger, which is now prevented, as the iron is not affected by it. The beam-ends were cut clear from the walls, and the beams are suspended by means of the iron levers, whose feet rest on the templets of the walls. An air grate was made, on the outside of the wall, to admit a current of fresh air to the ends of the timbers. The roof is now much safer than when originally made, as the timber is secured from decay; and, owing to the collar E, the bearings are now two feet shorter at each end of the beam; the bearing on each beam being now, in the whole, four feet shorter than in its original state.

After the beams were brought to their proper height, and the levers and screws adjusted, screw-bolts were put into the timber, through holes purposely left in the lever, betwixt D and F, and the whole work thus perfectly secured.

At the other end of the Girder M, *Plate III, is shown another method of supporting Timbers, where the ends are decayed.*

The particular irons used in this way are shown in *Plate IV. Fig.* 4. N is a collar for the girder; O, an iron frame which rests on the templet; PP, two nuts which raise the collar N. RR show the clawed ends of the two bars of iron, extending under the girder, bedded therein, and screwed to it at their extremities, about five feet distant from the templet.

Fig. 5, is one of the iron bars last mentioned.

S is the claw or lap which projects over the collar N.

T is the place where it is screwed into the girder.

Fig.

Fig. 6 *and* 7. *Plate IV. explain a third method of securing decayed Timbers.*

Fig. 6, gives a side-view of a decayed girder: a, represents the templet; b, an iron lever, six feet long, nearly strait, being only cambered one inch, three inches wide, and three-quarters of an inch thick; this lever extends along the side of the girder c, and is secured fimly to it by the side-irons d d d d, which are two inches wide, and full half an inch thick, pointed at the ends. The higher ends of these side-irons are driven into the girder, and the lower points pass through holes in the lever, into the lower part of the girder, and are held close to the girder by staples e e e e: the side iron next the templet may be fixed slanting, in order that it may enter sounder wood. A claw, f, which is part of the lever, rests on the wall-plate a, and is bedded in it; an iron plate, g, lying

lying under the girder and let into it, passes through the lever at h, connecting it with a similar lever on the opposite side, and which assists in the same way to support the girder: i, is a flooring joist, to show how deep the levers are inserted therein.

Fig. 7, shows the under part of the same girder; b b, are the bottoms of the two levers above mentioned, fixed to the girder by the side irons and staples before described; k k, the broad feet of the levers which lie flat upon the wall plate; ff, the two claws projecting from the feet, in order to bed in the wall plate; iiii are joists, partly cut through, to admit the iron levers to lie close to the girder: g shows the iron plate or collar on which the Girder bears; it is turned up an inch and a half at each end, to keep the levers close to the sides of the girder. This collar should be made out of inch-bar iron, with points projecting from it, in the same manner as the collar

collar at D D, *Fig.* 1, to connect it with the levers, by passing through holes made through them for that purpose.

To fix the levers, put a shore two feet six inches from the wall, under the girder, to support it; then cut off the decayed end, and take out the templet, or part of the wall plate if decayed; and put in a stone templet for the irons to rest upon, with mortices in the stone to admit the claws of the lever: then fit the collar underneath the girder, two feet from the wall, to answer the holes in the lever; make an incision in the joists three-fourths of an inch wide, and three inches deep, to admit the levers; fix the levers on each side with the collar, so as to force up the levers together; then with slight shores force up the ends of both levers together, and fix the side-irons firm. The girder will thus be perfectly safe.

The templet or wall plates, on which the levers rest, are made of Portland stone,

stone, three feet long, nine inches wide, and five inches deep, with incisions or mortices made therein for the claws of the levers.

Certificates, confirming Mr. Woart's Improvements, were received from the Commissioners of the Navy, from Mr. Joseph Harris, smith, at Putney, and Mr. George Smith, surveyor, at Putney.

The

Mr. Hoark's method of supporting Decayed Timbers.

Fig. 7.

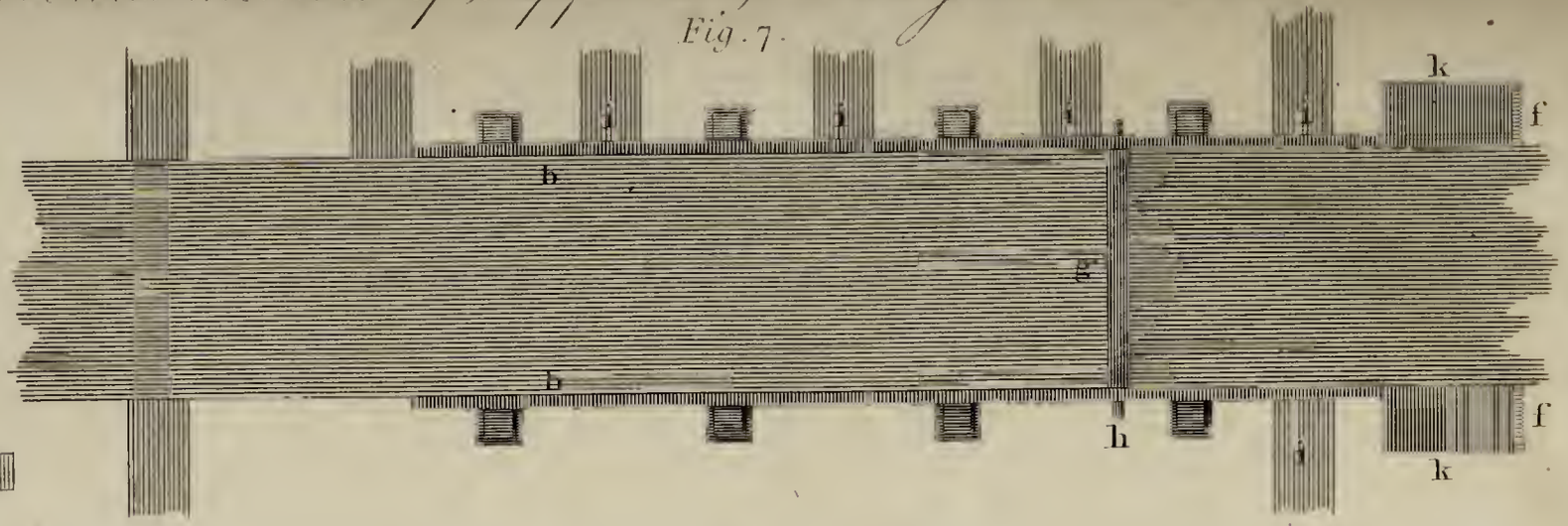


Fig. 3.

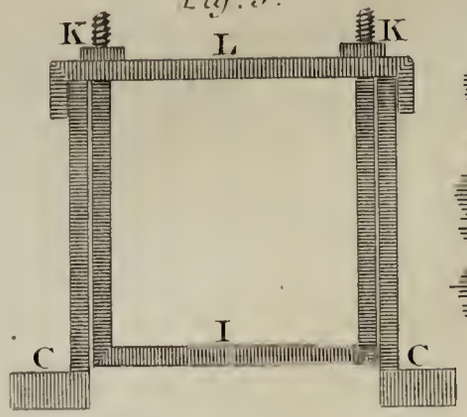


Fig. 4.

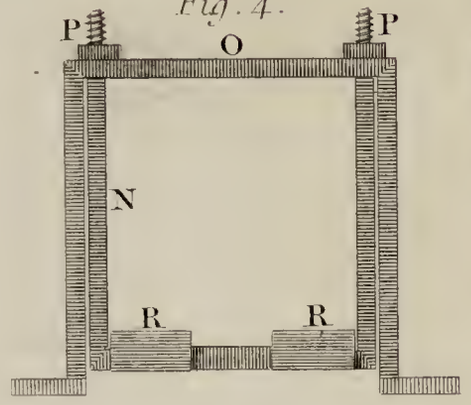


Fig. 6.

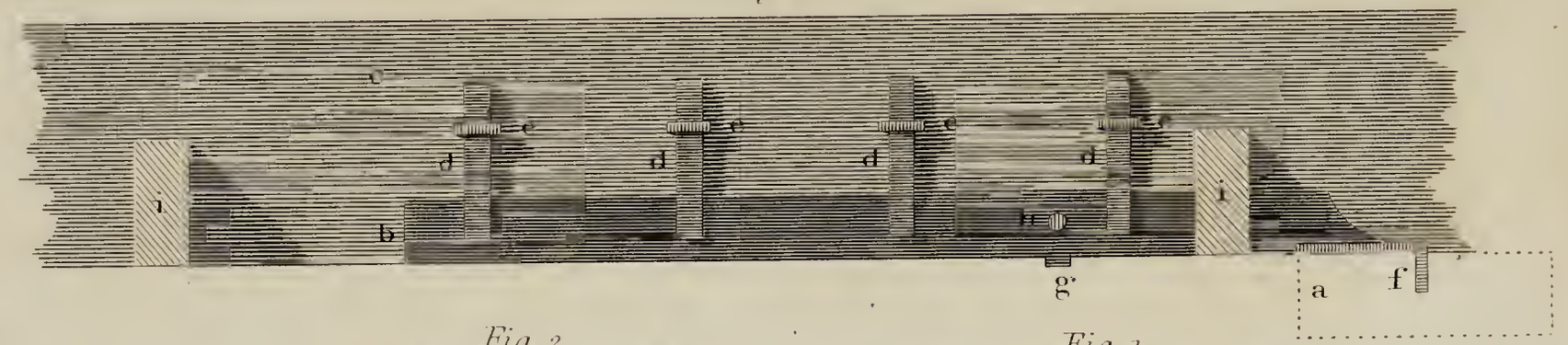


Fig. 5.

Fig. 2.

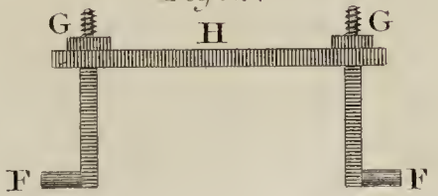
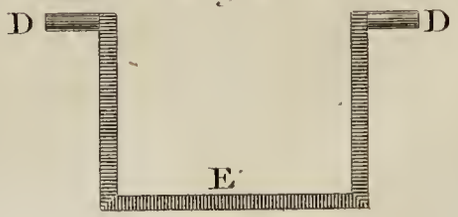


Fig. 1.



Lowry sculp.

The GOLD MEDAL, or ONE HUNDRED POUNDS, at the option of the Candidate, being the Premium offered for the Discovery of a QUARRY OF MILL-STONES, equal to those known by the name of French Burrs, was this Session adjudged to Mr. JAMES BROWNHILL, of Alloa-Mills, near Stirling, in Scotland; who made choice of the Pecuniary Reward. The following Accounts and Certificates were received relative to these Mill-stones.

SIR,

AMONG the various premiums offered by the Society for the Encouragement of Arts, etc. I observe that there is one for the person who shall discover, in Great-Britain, a Quarry of Stone fit for the purposes of Mill-stones, for grinding Wheat, and equal

in

in all respects to that known by the name of French Burr. I have therefore taken the liberty of inclosing a particular account of the execution of a pair of those Mill-stones, which have been lately built at my Mills here, compared with the execution of the Burr-stones. The Mills are on a large scale; and the Alloa-mill Company, who carry on an extensive business, pay a high rent for them.

They have a very intelligent industrious man for their head miller, who, in consequence of the high price of French Burrs, and the very great difficulty of procuring any of them at present, was very anxious to try if any substitute could be found; and he flatters himself that he has been fortunate enough to find some Stones, in this neighbourhood, that will answer equally well as the French. Their performance has been such, that two other pair are bespoke; and in all probability many more

more will be built before the time proposed for laying the discovery and claim before the Society. Should the discovery answer the present expectations, the Society will rejoice to find that the situation of the Quarry is so near this port, where any quantity of the rough stones, or in their more perfect state, can be easily transported to any place accessible by water-carriage.

I am, SIR,

Your most obedient humble Servant,

T. F. ERSKINE.

Tower of Alloa, Clackmananshire,
June 24, 1800.

MR. CHARLES TAYLOR.

On the 20th of June, 1800, ground twelve Quarters of Wheat of three different qualities; six Quarters were ground on French-burr Mill-stone, and six Quarters on Mill-stones built of the Stone from Abbey's Craig, in Stirlingshire.

Qrs.	Bush.			Sks.	Cwt.	Qrs.	lb.	lb.
1	4	of Wheat	53¾ lb. Avoid. per Bush.	—	—	—	—	645
2	..	Do.	57¾	—	—	—	—	924
2	4	Do.	56	—	—	—	—	1120
6	Qrs.			..	..	..	..	2689

Produce of the above six Quarters, per French Burrs.

Of fine Flour.....	5	—	2	20	1476
second do.....	—	2	—	3	227
third do.....	1	—	2	9	345
	7	—	3	4	2048
Bran	—	4	3	17	549
Waste.....	—	—	—	—	92
Weight as above..	..	..	..	..	2689

N. B. The Bran, measured with the Winchester bushel, and ſtruck, turned out 26 bushels. Ground in three hours and forty minutes.

Ditto per Abbey Craig Mill Stones.

Of fine Flour.....	5	1	2	27	1595
second do.....	—	2	—	19	243
third do.....	—	2	—	20	244
	7	1	—	10	2082
Bran	—	4	2	14	518
Waste	—	—	—	—	89
Weight as above..	..	..	..	..	2689

The Bran measured 32 bushels, although 31 lb. lighter than that produced by the French Burrs. Ground in three hours and ten minutes.

Each

Each mill-stone is about twenty-five hundred weight, six pieces in the bed, and fourteen in the runner, four feet and a half diameter, eleven inches thick at the hem, and thirteen at the eye; each stone, divided into nine spaces, having ten circular roads in each space: they flag the bran, and do not heat the flour so much as French Burrs, being much evener in the face than the latter. I have ground four hundred quarters with them, and they have required but little dressing during the grinding of that quantity; but there is very little taken off them, as they are very hard.

A Certificate from James Brownhill, dated Alloa, January 16, 1801, declares that the Quarry, from which these stones are taken, is situated about a mile north-east from the Castle of Stirling, named Abbey Craig; and that it is a huge mass of whinn-rock of various texture, and strikes fire with steel; that the pair of stones sent to the Society are the first

that were made, and have ground about a thousand quarters of wheat to the satisfaction of the bakers.

It also states, that five quarters of wheat were ground with them in a hundred and eight minutes, the stone making one hundred and thirty-one revolutions per minute; heat of the flour 64° Fahrenheit's thermometer. The stone being of a uniform hardness, executes its business better than the French Burr-stones.

The produce of the above five quarters of wheat, 60lb. per Winchester bushel, 2400lb.

	lb.
Produced fine Flour	1464
second do.	222
third do.	241
	1927
Broad bran 242 / Small do. 200	442
	2369
Waste. . .	31
	2400

These

These stones cost about twenty guineas per pair, and, when first made, weighed nearly twenty-five hundred weight each. They require to be somewhat oftener dressed than French Burr-stones; but the time which is lost in dressing is more than compensated in the after execution. Taking in the time for dressing, these stones have, on an average, ground thirty-six quarters in twenty-four hours.

A letter from Mr. Erskine, dated January 3, states, that many bakers, from Glasgow and Paisley, have preferred the flour made from these stones, to that ground by the French Burr. It also states, that the place from whence these stones were taken, is situated near Stirling, close on the banks of the Forth, called the Abbot's Craig. It is a particular kind of that stone which is known in this county by the name of Whinn-stone, which resembles the stones from Aberdeen, but is of a more open

texture. There is reason to believe that stones of the same kind are to be found in various parts of Scotland; which Mr. Erskine flatters himself the Society will think enhances the discovery of James Brownhill.

A certificate from Andrew Lind, and G. Younger, bakers, dated January 16, 1801, certifies, that the flour ground by these mill-stones was equal in every respect to that ground by French Burr-stones.

A letter from John Burns, mill-stone builder, states, that he has been long employed as a builder of French Burr-stones, and that he has now been six months engaged in making mill-stones from Abbey Craig, which he has employed, and which make excellent work.

A letter from Mr. Erskine, dated January 17, 1801, confirms the above circumstances and signatures.

A letter from Mr. Erskine, dated April 7, 1801, informs the Society, that

he

he had forwarded for their inspection, samples of flour ground by the Alloa Mill-stones, and other samples ground by French Burr-stones, for comparative experiments. The Committee found those ground by the Abbey-Craig Stones to be the best.

A letter from William Glenn, dated Lithgow Mills, December 11, 1801, states that he was so well pleased with the mill-stones which he had procured from Abbey-Craig, that he had ordered another pair, and should leave off French Burrs entirely.

A letter from John Cowan, dated Hawk-head Mill, December 16, 1801, speaks highly in favour of the Abbey-craig Mill-stones, in comparision with the French Burr.

W. Crawford, in a letter, dated Bainsford Steam-engine, January 7, 1802, declares, that he has no hesitation in attesting that he considers the Abbey-craig Mill-stones to be superior to

French Burr-stones for flour-manufacture; that, although they require to be oftener dressed than Burr Stones, they will grind considerably more wheat in a given time, upon an equal power; and that he considers them an invention highly beneficial to this Country.

A second memorial from James Brownhill, the claimant, dated Jan. 12, 1802, notices, that the first pair of mill-stones of the Abbey-craig kind, were set a-going at Alloa, in May, 1800; since which time thirty-six and a half pairs had been made; that all which had been used had given satisfaction; that they had been employed in various parts of Scotland; and that one pair had been sent to Prussia.

A letter from Alexander Bald, agent for the Alloa-Mill Company, dated January 13, 1802, greatly commends the Abbey-craig Stones, and observes, that flour ground with them gives great satisfaction; that when the power of the mill is able to grind three bolls per hour with

with French Burrs (each boll being more than four Winchester bushels) the Abbey-craig Stones will grind three quarters of a boll more each hour; and from good wheat produce one eighth more of fine-flour per boll; that they are not under the necessity of running the Abbey-craig Stones so close set as Burrs, which enables them to feed faster without bringing an extra heat upon the flour.

A letter from Mr. Erskine, dated January 15, 1802, confirms the above Certificates, and states, that he is convinced, on any fair trial, the Abbey-craig Mill-stones will be found to excel all others yet made use of; that he will direct any further experiments to be made in that neighbourhood relative to them, which the Society may suggest, as the Alloa-Mill Company are convinced that the trial will prove how deserving poor James Brownhill is of having a good reward for his ingenuity.

He further adds, that mill-stones are now built at Alloa for sixteen guineas; which

which is very nearly about one fourth the price of French Burr.

A subsequent letter from Mr. Erskine, states, that Robert Redman, Esq. Corn-Exchange, London, has been lately at Alloa Mills, and, in consequence of seeing their effects, has ordered two pair to be sent to him in London, and is to send to the Alloa Mills some Essex-wheat, to be ground there, and the produce returned to him in London.

By accounts lately received from Alloa, the Society have been informed that the manufacture of these mill-stones is carried on with great success by Mr. James Brownhill, at Alloa Mills, in the county of Clackmanan, North Britain; that he executes orders for them, addressed there, upon moderate terms; and that, from his experience as a miller, he takes care to build them of such a grain as will best suit the purposes for which they are ordered.

The

The GOLD MEDAL and FIFTY GUINEAS were this Sesson voted as a Bounty to Mr. HENRY GREATHEAD, of South Shields, for a BOAT of a peculiar construction, named a *Life-Boat*, in consequence of the lives of many persons shipwrecked having been preserved by it.

Two Plates of this Boat are annexed to the following Communications on the Subject, and a Model of it is in the Repository of the Society.

SIR,

A CONSIDERABLE time has elapsed since I had the honour to lay before the Society a Model of the Life-Boat of my invention.

I have now inclosed a particular account of its construction, in a letter from Mr. Hinderwell, explaining upon what

what principle it is built, so as to render it superior to any other form of a Boat for the dangerous enterprises for which it was intended, and has been used.

I am, SIR,

Your humble Servant,

HENRY GREATHEAD.

South Shields, Jan. 1, 1802.

To Mr. CHARLES TAYLOR.

SIR,

IT is much to be lamented, that in an age enlightened by science, such a languid indifference should prevail on many important public occasions; and that the most excellent inventions should have to combat the force of inveterate prejudice.

How many valuable discoveries have languished in obscurity! How many useful projects have perished in embryo, deprived of the fostering aid of the public

public, and the patronage of influence and authority!—In the class of useful improvements for the diminution of the dangers incident to a maritime profession, the Life-Boat, invented by Mr. GREATHEAD, of SHIELDS, has a claim to a distinguished patronage.—An experimental conviction of its great utility in saving the lives of shipwrecked seamen, and of its perfect safety in the most agitated sea, has induced me to advocate the cause with a zeal proportioned to its importance; and it is a consolatory reflexion to my own mind, that my exertions have been successful in the introduction of a Life-Boat, in the port of Scarborough, and, I trust, not unprofitable towards promoting a similar establishment in other places.—The services which have been recently performed at this port, by means of the Life-Boat, in contributing to the preservation of the lives of the *crews* of *two vessels*, more than compensate for every

labour.

labour.—I am far from the ambition of aspiring to any honorary testimony on this occasion. Actuated by the purest principle of philanthropy, my sole object is the benefit of the community, and to endeavour, by ardent recommendations, to excite a spirit of emulation, in order to introduce the Life-Boat, with its invaluable properties, into more general use. I am induced to submit, with the utmost deference and respect, to the consideration of the Society of Arts, &c. the following description of the Life-Boat, with some miscellaneous observations.—The construction of the Boat, agreeably to Mr. GREATHEAD'S plan, is as follows :

The length is thirty feet; the breadth, ten feet; the depth, from the top of the gunwale to the lower part of the keel in midships, three feet three inches; from the gunwale to the platform *(within)*, two feet four inches; from the top of the stems (both ends being similar) to the

the horizontal line of the bottom of the keel, five feet nine inches. The keel is a plank of three inches thick, of a proportionate breadth in midships, narrowing gradually toward the ends, to the breadth of the stems at the bottom, and forming a great convexity downwards. The stems are segments of a circle, with considerable *rakes*. The bottom section, to the floor-heads, is a curve fore and aft, with the sweep of the keel. The floor-timber has a small *rise* curving from the keel to the floor-heads. A bilge plank is wrought in on each side next the floor-heads with a double *rabbit* or groove, of a similar thickness with the keel; and, on the outside of this, are fixed two bilge-trees, corresponding nearly with the level of the keel. The ends of the bottom section form that fine kind of entrance observable in the lower part of the bow of the fishing-boat, called a *Coble*, much used in the North. From this part to the top of the

the stem, it is more elliptical, forming a considerable projection. The sides, from the floor-heads to the top of the gunwale, flaunch off on each side, in proportion to about half the breadth of the floor. The breadth is continued far forward towards the ends, leaving a sufficient length of strait side at the top. The sheer is regular along the strait side, and more elevated towards the ends. The gunwale, fixed on the outside, is three inches thick.—The sides, from the under part of the gunwale, along the whole length of the regular sheer, extending twenty-one feet six inches, are cased with *layers* of cork, to the depth of sixteen inches downward; and the thickness of this casing of cork being four inches, it projects at the top a little without the gunwale. The cork, on the outside, is secured with thin plates or slips of copper, and the boat is fastened with copper nails. The *thwarts*, or seats, are five in number, *double banked*,

banked, consequently the boat may be rowed with ten * oars. The *thwarts* are firmly stanchioned. The side oars are short, † with iron tholes and rope grommets, so that the rower can pull either way. The boat is steered with an oar at each end; and the steering-oar is one third longer than the rowing-oar. The platform placed at the bottom, within the boat, is horizontal, the length of the midships, and elevated at the ends, for the convenience of the steersman, to give him a greater power with the oar. The internal part of the boat next the sides, from the under part of the *thwarts* down to the platform, is cased with cork; the whole quantity of which, affixed to the Life-Boat, is nearly seven hundred weight. The cork indisputably

 contributes

* Five of the benches are only used, the Boat being generally rowed with ten oars.

† The short oar is more manageable in a high sea than the long oar, and its stroke is more certain.

contributes much to the buoyancy of the boat, is a good defence in going alongside a vessel, and is of principal use in keeping the boat in an erect position in the sea, or rather, of giving her a very lively and quick disposition to recover from any sudden *cant* or *lurch* which she may receive from the stroke of a heavy wave. But, exclusive of the cork, the admirable construction of this boat gives it a decided pre-eminence. The ends being similar, the Boat can be rowed either way; and this peculiarity of form alleviates her in rising over the waves. The curvature of the keel and bottom facilitates her movement in turning, and contributes to the ease of the steerage, as a single stroke of the steering-oar has an immediate effect, the boat moving as it were upon a centre. The fine entrance below is of use in dividing the waves, when rowing against them; and, combined with the convexity of the bottom, and the elliptical form of

the

the stem, admits her to rise with wonderful buoyancy in high sea, and to launch forward with rapidity, without shipping any water, when a common boat would be in danger of being filled. The *flaunching*, or spreading form of the boat, from the floor-heads to the gunwale, gives her a considerable *bearing;* and the continuation of the breadth, well forward, is a great support to her in the sea; and it has been found by experience, that boats of this construction are the best sea-boats for rowing against turbulent waves. The internal shallowness of the boat, from the gunwale down to the platform, the convexity of the form, and the bulk of cork within, leave a very diminished space for the water to occupy; so that the Life-Boat, when filled with water, contains a considerably less quantity than the common boat, and is in no danger either of sinking or overturning. It may be presumed, by some, that in cases of high wind, agi-

tated sea, and broken waves, that a boat of such a bulk could not prevail against them by the force of the oars; but the Life-Boat, from her peculiar form, may be rowed *a-head*, when the attempt in other boats would fail. Boats of the common form, adapted for speed, are of course put in motion with a small power; but, for want of buoyancy and bearing, are over-run by the waves and sunk, when impelled against them: and boats constructed for burthen, meet with too much resistance from the wind and sea, when opposed to them, and cannot in such cases be rowed from the shore to a ship in distress. An idea has been entertained, that the superior advantages of the Life-Boat are to be ascribed solely to the quantity of cork affixed. But this is a very erroneous opinion; and, I trust, has been amply refuted by the preceding observations on the supereminent construction of this boat. It must

be

be admitted, that the application of cork to common boats would add to their buoyancy and security; and it might be a useful expedient, if there were a quantity of cork on board of ships, to prepare the boats with, in cases of shipwreck, as it might be expeditiously done, in a temporary way, by means of *clamps*, or some other contrivance. The application of cork to some of the boats of his Majesty's ships* might be worthy of consideration; more particularly as an experiment might be made at a little expence, and without inconvenience to the boats; or may prevent pleasure-boats from upsetting or sinking.

The Life-Boat is kept in a boat-house, and placed upon four low wheels, ready to be moved at a moment's notice. These wheels are convenient in conveying the boat along the shore to the sea;

 but

* The Launches.

but if she had to travel upon them on a rough road, her frame would be exceedingly shaken. Besides, it has been found difficult and troublesome to replace her upon these wheels, on her return from sea. Another plan has, therefore, been adopted. Two wheels, of nine feet diameter, with a moveable arched axis, and a pole fixed thereto for a lever, have been constructed. The boat is suspended near her center, between the wheels, under the *axis;* toward each extremity of *which* is an iron pin, with a chain attached. When the pole is elevated perpendicularly, the upper part of the axis becomes depressed, and the chains being hooked to *eye-bolts*, on the inside of the boat, she is raised with the utmost facility, by means of the pole, which is then fastened down to the stem of the boat.

The Scarborough Boat is under the direction of a Committee. Twenty-four fishermen,

fishermen, composing *two crews**, are alternately employed to navigate her. A reward, in cases of shipwreck, is paid by the Committee to each man actually engaged in the assistance; and it is expected that the vessel receiving assistance should contribute to defray this expence. None have hitherto refused.

It is of importance, that the command of the boat should be entrusted to some steady, experienced person, who is acquainted with the direction of the tides or currents, as much skill may be required in rising *them* to the most advantage, in going to a ship in distress. It should also be recommended, to keep the *head* of the boat to the *sea*, as much as circumstances will admit; and to give her an accelerated velocity to meet the wave. Much caution is necessary in approaching a wreck, on account of

* Two crews are appointed, that there may be a sufficient number ready in case of any absence.

the strong reflux of the waves, which is sometimes attended with great danger. In a general way, it is safest to go on the *lee* quarter; but this depends upon the position of the vessel; and the master of the boat should exercise his skill in placing her in the most convenient situation. The boatmen should practise themselves in the use of the boat, that they may be the better acquainted with her movements; and they should at all times be strictly obedient to the directions of the person who is appointed to the command.

The great ingenuity which has been displayed in the construction of the Life-Boat, leaves scarcely any room for improvement; but some have supposed, that a boat of twenty-five feet in length, with a proportionate breadth, would answer every purpose of a larger one. A boat of these dimensions would certainly be lighter, and less expensive; but whether she would be equally *safe* and

and *steady* in a high sea, I cannot take upon myself to determine.

Mr. Greathead, of South Shields, the inventor, undertakes to build these boats, and to convey them to any port in the kingdom. He is a worthy man, in whom a confidence may be reposed, and will build upon moderate terms of profit.

THOMAS HINDERWELL.

To Mr. CHARLES TAYLOR.

SIR,

I HAVE duly received your letter, and am greatly obliged to you for your polite attention towards me. Inclosed is a Certificate from the Gentlemen of South and North Shields, who are respectable men, and well versed in maritime affairs. Most of them are also known

known to Capt. Abel Chapman, an elder brother of the Trinity House, London. Capt. Reed, an elder brother of that House, whose benevolent views led him to try some experiments with one of these boats, may also be applied to.

Rowland Burdon, Esq. M. P. has authorised me to inform you, that he is in possession of certificates and documents respecting this boat, which may be referred to.

Having no regular journal of the transactions of these boats, I shall send you the principal events from some detached minutes.

They have been particularly patronised by his Grace the Duke of Northumberland. I built the Life-Boat for North Shields entirely at his expence, and he has endowed it with an annuity. I have since built another for him, which was sent to Oporto. As I am honoured with his correspondence, he also may be applied to. Besides the Life-Boats at the

the stations here, they have them now at Scarborough, Lowestoffe, Woodbridge; Montrose, and St. Andrew's, in Scotland. I am at present building one for Ramsgate; and am desired, by George Rose, Esq. M. P. to give him information respecting one for Christ Church, Hants. I am likewise applied to from Dublin, Liverpool, and other ports, concerning them.

I have been honoured with the Medallion from the Humane Society, on account of my Boat, and hope to merit the approbation of the Society of Arts.

I am, Sir,

Yours, &c.

Henry Greathead.

South Shields,
January 12, 1802.

To Mr. Charles Taylor.

Certi-

Certificate from North and South Shields.

WE, the under-signed resident Gentlemen and Ship Owners of South and North Shields, do certify, that the Life-Boat of South Shields, built in the year 1789, and the North Shields Boat, built in 1798, were invented and constructed by Mr. Henry Greathead, of South Shields; and have, during the last eleven years, been the means of saving between two and three hundred men, from ships wrecked in the course of that time, near the Mouth of Tynemouth Haven; and as the said Mr. Henry Greathead has made his models public, we recommend him to the Society instituted for the Encouragement of Arts, Manufactures, and Commerce, as deserving not only their countenance and support, but a reward suitable to the great good that has resulted to the community from this fortunate invention.

South

South Shields.

WILLIAM MASTERMAN,
CUTHBERT MARSHALL,
HENRY HEATH,
JOSEPH WILLIAM ROXBY,
JOSEPH BULMER,
CUTHBERT HERON,
LOCKWOOD BRODRICK,
JOHN ROXBY,
ROBERT STEPHENSON,
JOHN MARSHALL.

North Shields.

JOHN WALKER,
GEORGE FRENCH,
JOHN SCOTT,
SAMUEL HURRY,
WILLIAM CLARK,
STEPHEN WRIGHT, jun.
THOMAS HEARN,
HENRY TREWHITT,
WILLIAM CLARK, jun.
JOHN FENWICK, sen.

January, 1802.

Particulars

Particulars relative to the Construction of, and Benefits received from, sundry Life-Boats, built by Mr. HENRY GREATHEAD, *or under his directions, in and since the year* 1789.

ACCOUNT OF THE SOUTH-SHIELDS LIFE-BOAT.

FROM the declaration of Sir Cuthbert Heron, Bart. of South Shields, it appears, that when the Adventure was wrecked in 1789, on the Herd Sands, he offered a reward for any seamen to go off to save the men's lives, which was refused; and that the greatest part of the crew of the Adventure perished within 300 yards of the shore, and in sight of a multitude of spectators. The Gentlemen of South Shields immediately met, and offered a reward to any person who would give in a Plan of a Boat, which should be approved, for the preservation

servation of men's lives. Mr. Greathead gave in a plan, which met with approbation; a committee was formed, and a subscription raised, for the building of a boat upon that plan. After it was built, it was with some difficulty that the sailors were induced to go off in her; but, in consequence of a reward offered, they went off, and brought the crew of a stranded vessel on shore. Since which time the boat has been readily manned, and no lives have been lost (except in the instances of the crews trusting to their own boats); and, in his opinion, if Mr. Greathead's boat had existed at the time of the wreck of the Adventure, the crew would have been saved.

From other accounts it appears, that in the year 1791 the crew of a brig, belonging to Sunderland, and laden from the westward, were preserved by this Life-Boat, the vessel at the same time breaking to pieces by the force of the sea.

On

On January 1st, 1795, the ship Parthenius, of Newcastle, was driven on the Herd Sand, and the Life-Boat went to her assistance, when the sea breaking over the ship as the boat was ranging along-side, the boat was so violently shaken that her bottom was actually hanging loose; under these circumstances she was three times off to the ship, without being affected by the water in her.

The ship Peggy being also on the Herd Sand, the Life-Boat went off, and brought the crew on shore, when the plug in her bottom had been accidentally left out; though she filled with water in consequence, yet she effected the purpose in that situation.

In the latter part of the year 1796, a sloop belonging to Mr. Brymer, from Scotland, laden with bale goods, was wrecked on the Herd Sand; the crew and passengers were taken out by the Life-Boat; the vessel went to pieces at the time the boat was employed, the goods

goods were scattered on the sand, and part of them lost.

In the same year, a vessel named the Countess of Errol, was driven on the Herd Sand, and the crew saved by the Life-Boat.

October 15th, 1797, the sloop called Fruit of Friends, from Leith, coming to South Shields, was driven on the Herd Sand. One part of the passengers, in attempting to come on shore in the ship's boat, was unfortunately drowned; the other part was brought on shore safe by the Life-Boat.

The account of Capt. William Carter, of Newcastle, states, that on the 28th November, 1797, the ship Planter, of London, was driven on shore near Tynemouth Bar, by the violence of a gale; the Life-Boat came out, and took fifteen persons from the ship, which the boat had scarcely quitted before the ship went to pieces; that, without the boat, they must all have inevitably perished, as the

wreck came on shore soon after the Life-Boat. He conceived that no boat, of a common construction, could have given relief at that time. The ships Gateshead and Mary, of Newcastle, the Beaver, of North Shields, and a sloop, were in the same situation with the Planter. The crew of the Gateshead, nine in number, took to their own boat, which sunk, and seven of them were lost; the other two saved themselves, by ropes thrown from the Mary. After the Life-Boat had landed the crew of the Planter, she went off successively to the other vessels, and brought the whole of their crews safe to shore, together with the two persons who had escaped from the boat of the Gateshead.

Mr. Carter adds, that he has seen the Life-Boat go to the assistance of other vessels, at different times, and that she ever succeeded in bringing the crews on shore; that he had several times observed

served her to come on shore full of water, and always safe.

ACCOUNT OF THE NORTHUMBERLAND LIFE-BOAT.

THE Northumberland Life-Boat, so called from being built at the expence of his Grace the Duke of Northumberland, and presented by him to North Shields, was first employed in November, 1798, when she went off to the relief of the sloop Edinburgh, of Kincardine, which was seen to go upon the Herd Sands, about a mile and a half from the shore. Ralph Hillery, one of the seamen who went out in the Life-Boat to her assistance, relates, that she was brought to an anchor before the Life-Boat got to her; that the ship continued to strike the ground so heavily, that she would not have held together ten minutes longer, had not the Life-Boat arrived; they made her cut her cable, and then

took seven men out of her, and brought them on shore; that the sea was at that time so monstrously high, that no other boat whatever could have lived in it. He stated, that, in the event of the Life-Boat filling with water, she would continue still upright, and would not founder, as boats of a common construction do; that he has seen her go off scores of times, and never saw her fail in bringing off such of the crews as staid by their ships.

It also saved (as appears from other accounts) the crew of the brig Clio, of Sunderland, when she struck upon the rocks, called the Black Middens, on the north side of the entrance of Tynemouth Haven.

October 25th, 1799, the ship Quintillian, from St. Petersburgh, drove on the Herd Sand, from the force of the sea-wind at N. E. knocked her rudder off, and was much damaged; but the crew were brought on shore by the Life-Boat.

Boat. The great utility of this Life-Boat is also confirmed by many other recent circumstances: one among which is that of the ship Sally, of Sunderland, which, in taking the harbour of Tynemouth, on December 25th, 1801, at night, struck on the bar: the crew were brought on shore by the Life-Boat, but the ship was driven among the rocks.

On the 22d of January, 1802, in a heavy gale of wind, from the N. N. W. the ship Thomas and Alice, in attempting the harbour of South Shields, was driven on the Herd Sand: the Northumberland Life-Boat went to her assistance; took, as was supposed, all the people out, and pulled away from the ship to make the harbour, when they were waved to return by a man who had been below deck. On taking this man out they encountered a violent gust of wind, under the quarter of the ship; the ship at the same time drove among the breakers; and, entangling the boat

with her, broke most of the oars on that side of the boat next the ship, and filled the boat with water. By the shock, several of the oars were knocked out of the hands of the rowers, and that of the steersman. In this situation, the steersman quickly replaced his oar from one of those left in the boat, and swept the boat before the sea, filled with water inside as high as the midship gunwale: the boat was steered in this situation before the wind and sea, a distance far exceeding a mile, and landed twenty-one men, including the boat's crew, without any accident, but being wet.

ACCOUNT OF THE SCARBOROUGH LIFE-BOAT.

SIR,

THE Life-Boat at Scarborough, which was built without the least deviation from the model and the plan which you sent here at my request, has

even

even exceeded the most sanguine expectations; and I have now received experimental conviction of its great utility in cases of shipwreck, and of its perfect safety in the most agitated sea. Local prejudices will ever exist against novel inventions, however excellent may be the principles of their construction; and there were some, at this place, who disputed the performance of the Life-Boat, until a circumstance lately happened, which brought it to the test of experience, and removed every shadow of objection, even from the most prejudiced minds.

On Monday, the 2d of November we were visited with a most tremendous storm from the eastward, and I scarcely ever remember seeing a more mountainous sea. The Aurora, of Newcastle, in approaching the harbour, was driven ashore to the southward; and, as she was in the most imminent danger, the Life-Boat was immediately launched to

her assistance. The place where the ship lay was exposed to the whole force of the sea, and she was surrounded with broken water, which dashed over the decks with considerable violence. In such a perilous situation the Life-Boat adventured, and proceeded through the breach of the sea, rising on the summit of the waves, without shipping any water, except a little from the spray. On going upon the lee-quarter of the vessel, they were endangered by the main-boom, which had broken loose, and was driving about with great force. This compelled them to go alongside, and they instantly took out four of the crew; but the sea which broke over the decks having nearly filled the boat with water, they were induced to put off for a moment, when, seeing three boys (the remainder of the crew) clinging to the rigging, and in danger of perishing, they immediately returned, and took them into the boat, and brought the whole to land

land in safety. By means of the Life-Boat, built from your plan, and the exertions of the boatmen, seven men and boys were thus saved to their country and their friends, and preserved from the inevitable destruction which otherwise awaited them. The boat was not in the least affected by the water which broke into her when alongside the vessel; and, indeed, the boatmen thought it rendered her more steady in the sea. I must also add, that it was the general opinion that no other boat of the common construction could have possibly performed this service; and the fishermen, though very adventurous, declared they would not have made the attempt in their own boats.

We have appointed a crew of fishermen to manage the boat, under the direction of the Committee; and the men are so much satisfied with the performance of the boat, and so confident in her safety, that they are emboldened to adven-

adventure upon the most dangerous occasion. I have been thus circumstantial, in order to show the great utility of the Life-Boat; and, I should think, it would be rendering an essential service to the community, if any recommendation of mine should contribute to bring this valuable invention into more general use.

I remain, SIR,

Your most obedient Servant,

THOMAS HINDERWELL.

Scarborough,
17th Nov. 1801.

To Mr. HENRY GREATHEAD,
South Shields, the Inventor of the Life-Boat.

BY other accounts, furnished to the Society, it appears that the Scarborough Life-Boat, on the 21st of November, 1801, was the means of saving a sloop belonging to Sunderland, and her

her crew, consisting of three men and boys: also the Experiment, of London, her cargo, and crew consisting of eight men and boys, when in a distressed and perilous situation, on the 22d of January last, which facts are attested by eleven owners of ships resident in Scarborough.

In the course of the last twelve years, several ships and vessels, which have not been included in the above accounts, have been driven on shore in bad weather, and got off again afterwards: the crews have been saved by being taken out by the Life-Boats, whereas, if they had remained on board, they must have perished, the sea making a passage over them.

THE Duke of Northumberland presents his compliments to Mr. Taylor, and is extremely happy to hear that the subject of the Life-Boat is before the Society. Mr. Greathead has, undoubtedly,

doubtedly, great merit; and the Duke will be much pleased to hear that the Society considers him as deserving their notice. As the Duke cannot help feeling himself much interested on this subject, he shall be obliged to Mr. Taylor for any further communications he may please to make him relative to it.

It is with infinite satisfaction the Duke informs Mr. Taylor, that he has just received a letter from the North, to acquaint him that the Life-Boat had, on Christmas night, saved the crew of a vessel which was lost upon the rocks in one of the most boisterous nights and violent wind that was ever known.

Northumberland-House.
Jan. 18, 1802.

To Mr. Charles Taylor.

THESE are to certify, that the Elder Brethren of the Trinity-House, having received repeated testimonies of the

the utility of the Life-Boat, invented by Mr. Henry Greathead, of South Shields, in saving the lives of shipwrecked mariners, are of opinion, that the invention is of such national importance as to merit every possible encouragement.

By order of the Corporation,

(Signed) JAMES COURT.

Trinity-House,
4th February, 1802.

SIR,

I AM sorry it was not in my power to pay more early attention to your favour of the 15th ultimo, having ever since been so much indisposed as to be confined entirely to my bed and chamber until within the last few days. I have now the pleasure to see by the papers, that the Society have already adjudged to Mr. Greathead a handsome

gratuity

gratuity for his useful and ingenious invention; a reward, of all others, in my opinion, the most deservedly bestowed, as his Life-Boat has certainly preserved many brave seamen, both at Shields and Sunderland who must otherwise inevitably have perished.

It is truly astonishing to see with what zeal and magnanimity our watermen encounter the most tremendous seas, by means of this boat, which is found to answer every purpose for which it was designed, beyond the expectations of the most sanguine; and, were its use universally adopted, the general benefit would undoubtedly soon exceed calculation.

I am, SIR,

Your most obedient Servant,

WILLIAM ORTON.

Sunderland,
April 30, 1802.

To Mr. CHARLES TAYLOR.

SINCE

SINCE the award of the Society's bounty to Mr. Greathead, the sum of twelve hundred pounds has been voted to him by Parliament for his Life-Boat.

He has also received other rewards on the same account from the Trinity-House, and Members at Lloyd's, which have been noticed in the public news-papers.

Description

Description of the Engravings of Mr. H. GREATHEAD'S *Life-Boat.*

PLATE V.

The fore part of the Engraving presents a perspective view of the Life-Boat rising over a heavy surge, and going out to the assistance of a ship, which appears at the edge of the horizon, in distress.

In the Life-Boat are ten rowers pulling along to get to the ship.

At the lower end of the boat, a man is steering her with a long oar towards the ship, whilst another person is ready with an oar, at the higher end of the boat, to steer the boat on her return; both ends of the boat being formed alike, in order to use either at will, in going to or coming from the ship.

The sheer or curve of the boat rising considerably from the centre to the stems, or ends, is clearly distinguished; also

A Perspective View of Mr. H. Greathead's Life Boat going out to assist a Ship in Distress.

Lowry sc

Drawn from a Model presented by Mr. Greathead to the Admiralty.

also the coating of cork, secured by slips of copper, along the outside of the boat, near the part where the rowers are seated.

N. B. It was first intended to have pointed out the particular parts of this Plate, by letters engraved upon it; but it being found that such insertions would be a disadvantage to the Engraving; and that, if any difficulties occurred, they would be clearly explained by letters in the following Plate of the sections; they have been here omitted.

Plate VI. Fig. 1. *A longitudinal Section of the Life-Boat.*

E E E	The sheer or curve of the boat.
I I	The two stems or ends.
K	The keel.
L L	The aprons, to strengthen the stems.

MM The sheets, or places for passengers.

NN Timber-heads, or boat-fastenings.

OOOOO The tholes on which the oars are slung by grommets.

T Flooring under the rowers feet.

Fig. 2. A cross Section of the Life-Boat.

F F The outside coatings of cork.

G G The inside cork filling.

H H The outside planks of the boat.

I One of the stems of the boat.

K The keel.

NN The timber-heads.

P The thwarts, or rowers seats.

R One of the stanchions under the thwarts, each being thus firmly supported.

S A section of the gang-board, which crosses the thwarts, and forms the passage from one end of the boat to the other.

T The floor-heads, or platform for the rowers feet.

V V The two bilge pieces, nearly level with the keel.

W W The gunwales.

X A ring-bolt for the head-fast, there being another also at the other end.

Y Platform for the steersman.

Fig. 3. A Truck or Carriage with four Wheels, to convey the Boat to and from the Sea.

a An oblong frame of wood, consisting of two long pieces, hollowed a little to admit the body of the boat, and secured by the cross pieces, b b.

cccc Four low wheels, each sunk or hollowed in the middle, to run better upon a rail-way or timber-road.

dd Two indents made in the side-timbers, that the bottom of the boat may lie firm therein.

ee Two small rollers, moveable, in the cross timbers, for the keel of the boat to slide upon.

ff Two long rollers one at each end of the frame, to assist in raising the boat upon or sliding it off the truck or carriage.

Management of the Life-Boat, from the Boat-House to the Sea, and vice versâ, *as practised at Lowestoffe, in Suffolk.*

THE Life-Boat may be launched from any beach, when wanted, with as much ease as any other boat, by proper assistance. The distance from the boat-house, at Lowestoffe, to the shore, is one hundred yards, and the boat's crew can run her down in ten minutes.

When

When the sea does not tumble in upon the beach very much, the boat may be easily launched by laying the ways as far as possible in the water, and hauling the carriage from under her.

When there is a great sea on the beach, the boat must be launched from the carriage before she comes to the surf, on planks laid across, as other boats are launched; the people standing on the ends to prevent the sea moving them; then, with the assistance of the anchor and cable (which should be laid out at sea for the purpose), the boat's crew can draw her over the highest sea.

Upon the boat returning to the shore, two double blocks are provided; and, having a short strop fixed in the hole, in the end of the boat next the sea, the boat is easily drawn upon the carriage. The boat's crew can run her any distance upon a clear shore by the carriage of Mr. Greathead's contrivance.

Account of, and Instructions for, the Management of the Life-Boat.

THE Boats in general of this description are painted white on the outside, this colour more immediately engaging the eye of the spectator at her rising from the hollow of the sea, than any other. The bottom of the boat is at first varnished (which will take paint afterwards), for the more minute inspection of purchasers. The oars she is equipped with are made of fir, of the best quality, having found by experience that a rove-ash oar that will dress clean and light, is too pliant among the breakers; and when made strong and heavy, from rowing double banked, the purchase being short, sooner exhausts the rower, which makes the fir oar, when made stiff, more preferable.

In the management of the boat, she requires twelve men to work her; that

is,

is, five men on each side, rowing double banked, with an oar slung over an iron thole, with a grommet (as provided) so as to enable the rower to pull either way; and one man, at each end, to steer her, and to be ready at the opposite end to take the steer oar, when wanted. As, from the construction of the boat, she is always in a position to be rowed either way, without turning the boat, when manned, the person who steers her should be well acquainted with the course of the tides, in order to take every possible advantage: the best method, if the direction will admit of it, is to head the sea. The steersman should keep his eye fixed upon the wave or breaker, and encourage the rowers to give way, as the boat rises to it; being then aided by the force of the oars, she launches over it with vast rapidity, without shipping any water. It is necessary to observe, that there is often a strong reflux of sea, occasioned by the stranded

wrecks, which requires both dispatch and care in the people employed, that the boat be not damaged. When the wreck is reached, if the wind blows to the land, the boat will come in shore without any other effort than steering.

I would strongly recommend practising the boat, by which means, with experience, the danger will appear less, from the confidence people will have in her from repeated trials.

HENRY GREATHEAD.

South Shields,
October 13, 1802.

SIR,

I SHALL have a complete model of my Life-Boat, on the scale of one inch to a foot, ready to send to the Society in a little time; and it having been much desired that the Life-Boat might be brought into general use, for ships, (in which case, it is a great object to have her

her to sail), I have, in a model lately made, adopted the sliding keel (an improvement of the Dutch Lee-Board), with the addition of one of them at one end sliding angular, so as to correspond with the keel of the rudder, at any depth. This angular sliding keel is entirely new: I have shewn the improvement to several nautical men, who highly approve of it. I shall finish the model for the Society in the same manner.

The keels and rudder are attached in such a manner, that she can be easily divested of them, when necessary, and will then be the exact form of the original Life-Boat. I should have sent you the model before this time; but the orders for Life-Boats have been so numerous, and so generally pressing, that I have not yet had time to execute it.

The Life-Boats I lately sent to Whitby and Redcar, have recently been the means of saving the lives of many persons, from ships wrecked, who must otherwise

otherwise have perished; for the particulars of which, I refer you to the Newcastle Chronicle of the 11th instant, which I hope will be satisfactory to the Society, to whom I shall be very happy, on all occasions, to transmit my improvements.

I remain, Sir,

Your obliged and obedient Servant,

HENRY GREATHEAD.

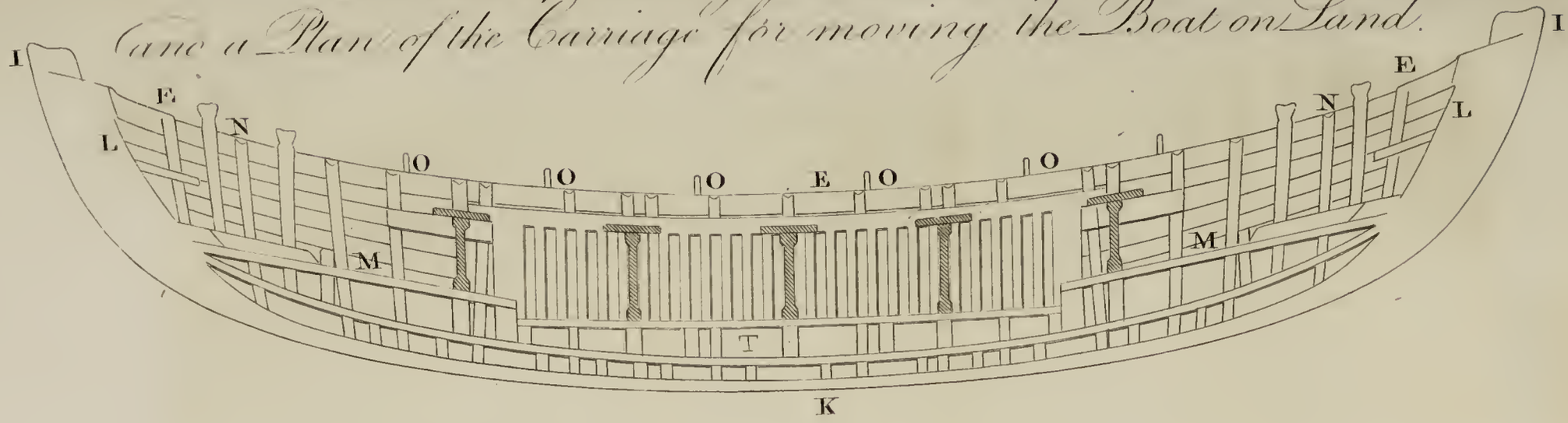
South Shields,
December 17, 1802.

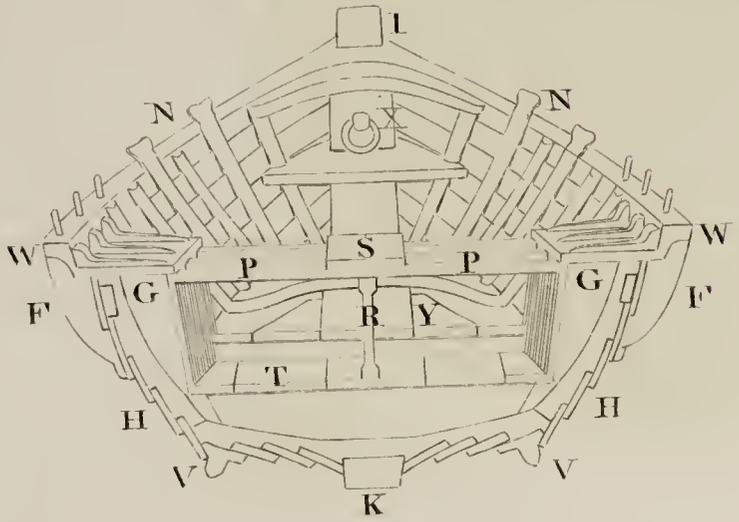
To Mr. CHARLES TAYLOR.

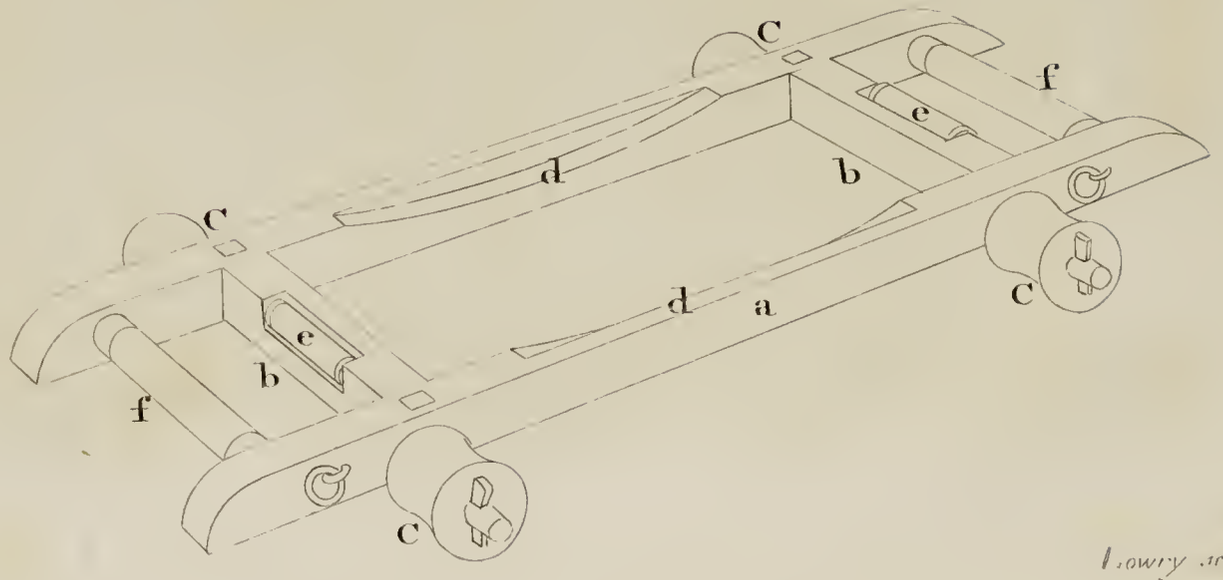
The

Sections of Mr. Greathead's Life Boat.

Also a Plan of the Carriage for moving the Boat on Land.







Lowry sculp

The GOLD MEDAL of the Society was this Session voted to WILLIAM HALL TIMBREL, Esq. of Streatly, in Berkshire, for an improved HERNIARY TRUSS, and new-invented CALICO CUSHION. The following Account and Certificates were received from him. A Model of part of the Human Body, and the Trusses from which the annexed Engravings are taken, were presented by him to the Society, and are placed in their Repository.

SIR,

I DESIRE you will present to the Society of Arts, &c. a Model of part of the Human Body, to which I have applied the instrument called a Truss, for the purpose of effectually keeping up inguinal and scrotal ruptures; also, my new invention, the Calico Cushion. You will

will please to observe, that this subject is not introduced to the Society, as arising from medical or surgical ideas; but for the purpose, by mechanical means, of causing relief to many afflicted persons, and assisting the cause of humanity. It is with this view I bring forward the model and my inventions, and not for the sake of any premium or bounty from the Society.

I am, Sir,

Your humble Servant,

WILLIAM HALL TIMBREL.

May 12, 1802.

To Mr. CHARLES TAYLOR.

SIR,

I BEG leave to explain the nature of those improvements in the Truss and Cushion, which I have had the honour of presenting to the Society of Arts, &c. Many of my suggestions are new. The whole

whole system of immobility, and the combination of mechanical action, to produce sufficient pressure on the aperture, or ring of the abdomen, are decidedly so, as well as the formation of the Cushion of Calico.

The hoop or spring part of the Truss is formed in an exact circular line with the pad. The pad is broad, and nearly, though not entirely flat; its neck is short, to lie in the hollow of the groin; for, if the neck touched the thigh, the Truss would move and the rupture descend.

Not much edging of leather projects from the hoop, and but little stuffing is put on the inside, as it lessens the elasticity of the spring. A double truss should be united behind, by a strap and buckle, to let out or take in; and both the front and hind straps should be sewed nearly one inch backwarder than usual. These straps should also be lined and edged, to increase their power of action. I have substituted a buckle, and its

double

double tongue received in a groove, for the usual brass knob on the pad of the Truss, which buckle, with the thigh-strap, firmly fixes the lower part of the pad against the body.

The thigh-strap is made of wash-leather, stitched and lined with tape, to prevent its stretching; and the end adjoining the buckle, is made of neat's leather.

This thigh-strap, the sewing-thread being doubled, twisted, and well waxed, is looped over the hoop part of the Truss, and in two lines of sewing is fixed thereto.

It is material to attend to the place of fixing the thigh-strap, which should be about one inch behind the great *trochanter*, or lower hip-bone, and in such a manner as to have a fair pull. This place cannot be exactly ascertained, till the Truss is tried on the patient.

The necessity of properly fixing the thigh-strap on the hoop, to keep up the rupture, must be apparent; because, when

when the belly pushes against the pad, under B, the sewing at A, draws B close to the body. *(See the Engravings).*

No Truss can be permanently retained in its place, without a thigh-strap; but sometimes it may be useful to line it on the inside with soft flannel, in order to prevent its chafing the thigh.

I will now add the description and uses of the Cushions of coarse Calico, CC, and the instructions how to form one; first observing, that calico has elastic and adhesive properties, which do not exist in linen or flannel.

Cut or tear a slip of coarse calico, about twelve inches in length, and for adults, three inches in breadth; fold it into a square, of a size that will project a quarter of an inch round the edges of the pad of the Truss, except that end next the thigh, which should have no projection beyond the neck of the pad. The rough edges of the cushion are worn upwards and downwards. Over the first

slip

slip many others are folded, to the thickness of about three-quarters of an inch; but the thickness must be regulated by the size of the patient. When the hollow in the groin is completely filled up, and the cushion quite immoveable, it is properly formed.

This Calico Cushion is to be worn under the pad or pads BB, of the Truss, as at CC and from time to time; an outer slip or two may be changed at pleasure, for the purposes of cleanliness, or restoring the cushion to a proper degree of thickness.

This cushion, when judiciously made, even with a bad Truss, if it is in a line with the aperture, will materially assist in keeping up a reducible rupture.

The properties of the Calico Cushion are,

First, that it protects the spermatic cord from being injured by the hard pad of the Truss; which injury, in common trusses, often produces hydrocele,

inflammation

inflammation of the spermatic vessels, hernia humoralis, &c. &c.

Secondly, by protecting the spermatic vessels from the injuries of pressure, it fulfils a *desideratum* never before obtained. It enables the patient to girt the Truss round the body with such an effective degree of tightness, that the rupture cannot descend.

Thirdly, by uniting the properties of softness and solidity, it yields to the form of the abdomen, and thus completely fills up the aperture, or ring, in the external oblique abdominal muscle, through which the rupture descends.

Fourthly, it affords an additional column of pressure; and the Truss being tightly fastened, keeps the omentum and intestines, all round and above the aperture, in a state of quietude, preventing any internal or partial descent of the bowels, &c.

It is necessary to repeat, that this Cushion, to obtain all its advantages,

must be formed of separate slips, folded over each other, and not of one piece of calico.

The method which I have used of placing the Truss, is in an exact circular line round the body, directly above the fissure of the posteriors; and the edge of the hoop part lodging on, over and above the great trochanter, and below the margin of the hip-bone, will keep the pad or pads of the Truss on the abdominal ring, producing ease, effect, and immobility.

The Truss, worn in the manner I describe, is not to be seen through the clothes, and it retains its elasticity a greater length of time than the old spiral trusses.

When the double Truss is put on, it should be pulled so very tight as to make the flesh between the two pads rise to the thickness of the fore finger; there will be no pain, for the pressure is only

only where it ought to be, immediately under the pad or pads of the Truss.

The thigh-strap also must be sufficiently short, and pulled close to the flesh, to have its action on B.

A single Truss will have the same action for a single rupture, by using the same methods.

By minutely following the above instructions, the reducibly ruptured patient may be freed from pain or danger.

I have the honor to be, Sir,

Your most humble Servant,

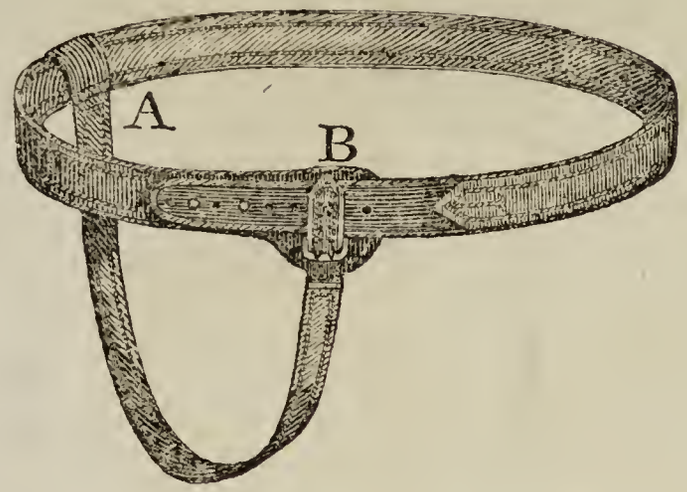
WM. HALL TIMBREL.

December 7, 1802.

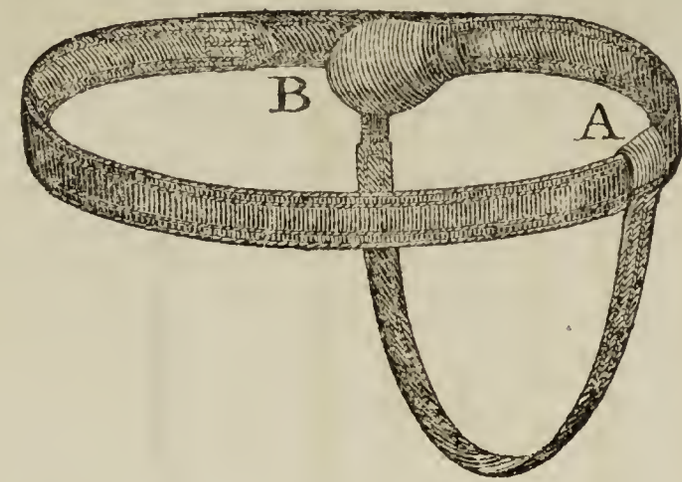
Certificates have been received from Mr. William Blair, Great Russel-street, Bloomsbury-square, and Mr. Thomas

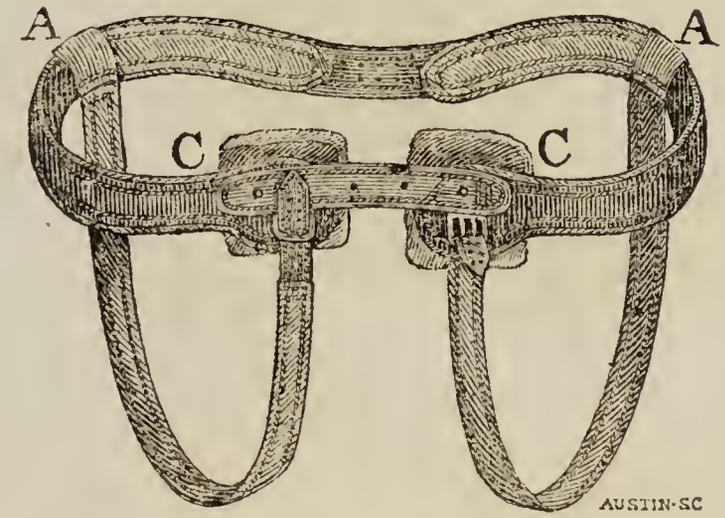
Payne, Brook-street, Members of the Royal College of Surgeons, in London, confirming, by cases in their practice, the utility of the improved Trusses and Cushion, recommended by Mr. Timbrel.

Improved Trufses by Mr. Timbrel.

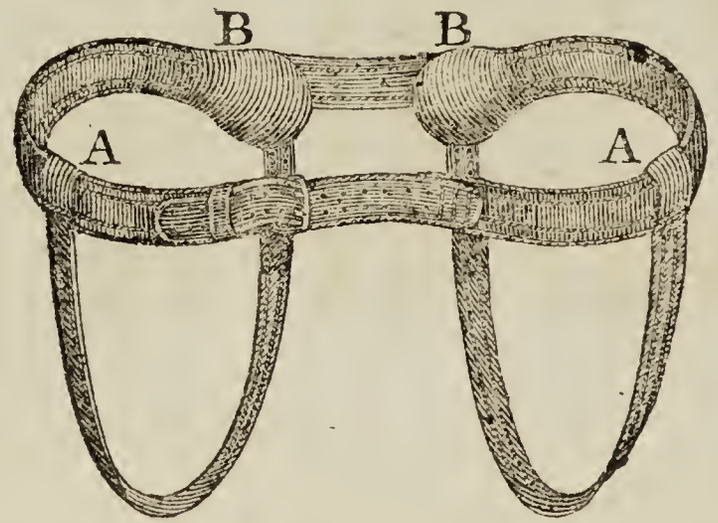


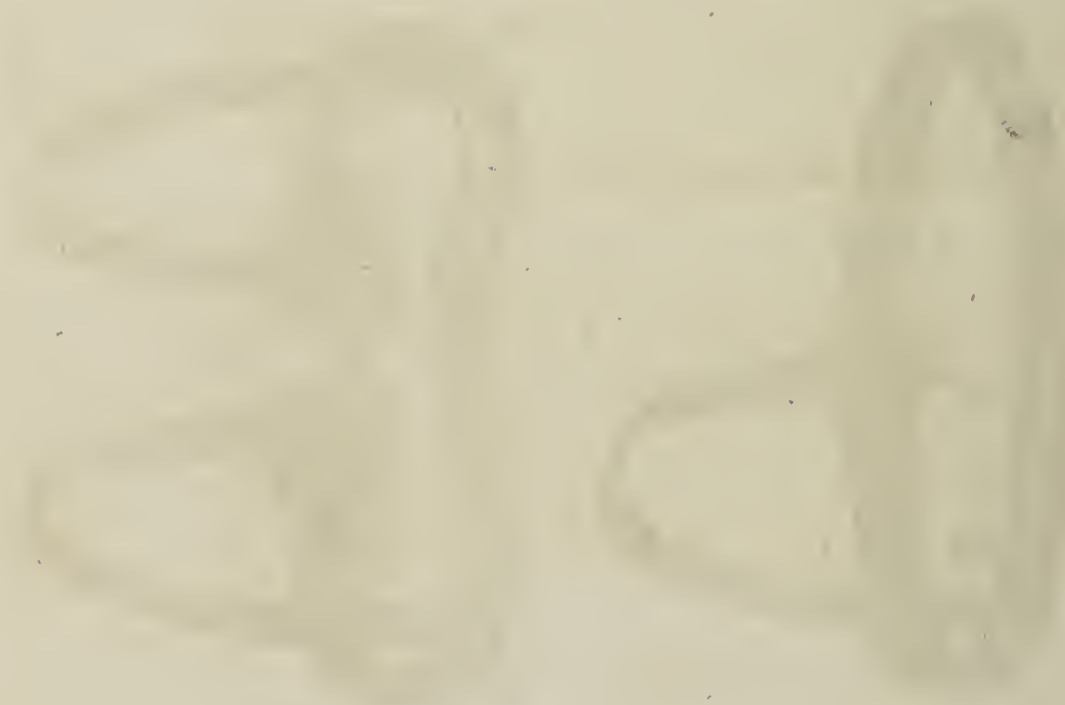
Single Trusses.





Double Trusses.





PAPERS

IN

MANUFACTURES.

MANUFACTURES.

A BOUNTY of TWENTY-FIVE GUINEAS was this Session voted to Mr. THOMAS CLULOW, No. 31, Old Cock-Lane, Shoreditch, for improving LOOMS in general, and for his invention of a Method of weaving PURSES, POCKETS, and SACKS.

A Model of this improved LOOM, *and some* PURSES *and* POCKETS *wove upon this Plan, are reserved in the Society's Repository, for the inspection of the Public. An Engraving and Description of the* LOOM *are annexed.*

SIR,

I HAVE made a small loom, agreeably to the orders of the Society, and hope it will answer their expectations. I have also brought models of sacks, purses,

purses, pockets, and wallets, wove in the loom, to show what it is capable of doing.

The articles wove in this way will be less liable to lose their contents than those whose seams are sowed with the needle, and will wear longer, and be less liable to want repairs.

I have also made improvements in the manner of setting up looms in general, which I have explained in my present model; so that this loom not only shows a new invention in weaving, but also a method of setting up looms of all kinds, so as to do their work better than in the common way. Any reward which the Society may think proper to afford me, will be thankfully accepted, and gratefully acknowledged, by,

SIR,

Your obedient Servant,

THOMAS CLULOW.

Shoreditch,
March 16, 1802.

MR. CHARLES TAYLOR.

AN

AN account of Mr. Clulow's plan for improving looms in general, particularly the Broad Silk Weavers Loom. (*See Plate* VII.)

An oblong frame A is laid down horizontally, and secured at the four corners with triangular braces, BBBB, to keep the frame properly square.

Four posts, CCCC, are fixed upright in mortice holes on the above frame. The front posts are supported both back and front with diagonal timbers, DDDD, to keep the breast roll E from giving way in the least by the heavy stroke of the batten FF on the quarter or work: the two hinder posts, GG, are held firm by two diagonal supports, HH, within the loom, to bear against the counter weights I I, and the great weight V, hanging on the work K, and the force of the batten F.

In a loom constructed on this plan, both strong and slight works may be made

made firm and good, without the loom having any shorings or supports; the advantages arising from which are the following, viz.

Poor indigent weavers being obliged to live in low-rented houses, the floors and party walls of the rooms where they weave are bad and weak, so that the common looms cannot be placed firm, and a man is perplexed to set up his loom in requisite order. If the loom is not set up firm, and secured from giving way in the working of it, no work can be made strong and good. One great disadvantage is done away by the bottom frame I use for fixing my loom upon, which can be placed by any common workman; whereas to set a loom up in the old method, requires great exactness and judgment, to prevent the work from being damaged.

If, in the common way, a loom is not properly put in the square, and firmly shored, which it is difficult to do, the

silk

silk chafes and cuts, the mind of the workman is harassed for want of knowing the real cause of it, or having sufficient knowledge to correct it; therefore the work is spoiled for want of a trifling alteration in the loom, and the blame frequently laid upon the silk when the error lies wholly in the loom.

If a common loom is put in its proper square, and has not a firm shoring or support, the work or cloth has not the firmness which it ought to have, and which it will have in my method. It frequently happens that the shorings or supports are too long and slender, or the places weak which they are fixed against, which causes a trembling motion in the loom; and if the loom shakes only the 100th part of an inch (which is not more on a moderate calculation than the breadth of each thread shot into the work), it will take out that stiffness there ought to be in the work; for if the loom does not stand firm against

the

the stroke of the batten, the work will lie hollow, be flimsey, and, though it takes as much silk as good work, it does not look well, nor will sell for so much money: the poor weaver is therefore turned out of employment, not knowing where the error lies; and the employer suffers in his property.

If the shores to the common looms, after being placed, either fall by accident or through the continual shaking of the loom whilst working, which circumstances will sometimes happen in the middle of a piece of work being done, it is with great difficulty that the loom can then be put in square, or supported as it ought to be; therefore it occasions the work to be spoiled.

Besides these, other difficulties frequently occur to a weaver where the loom is not properly fixed, squared, and shored, which those persons conversant in weaving well know. I shall mention one material instance, where, if the loom is originally

ginally well set up in the common way, it may be liable to great disadvantage, viz. its situation in regard to light, which is a main point, as in that case it cannot be moved without great risk, if any work is in it; whereas, if the loom is made according *to my model*, the weaver may slide it to any exactness that is requisite, as a few inches moving will permit the light to fall on the work properly without injury to the work, as my loom is firm and squared, without requiring the aid of any shores.

What I have said relative to this matter, will, I hope, give a satisfactory elucidation of my plan.

THOMAS CLULOW.

WE have examined this Model, and conceive it is a useful improvement.

Lea and Wilson, No. 26, Old Jewry.

Rennington, Wilson, and Co. Milk-street.

Gearing and Taylor, King-street, Cheapside.

Anthony Longuet, No. 23, Wood-street, Spital-fields.

Cotes, Titford, and Brookes, Union-street, Bishopsgate-street.

Hudswell, Thorp and Gardner, No. 30, Spital-square.

John Dubois and Sons, No. 20, Church-street, Spital-fields.

James Dickson and John Honyman, No. 7, Church-street, Spital-fields.

March 9, 1802.

Description

Description of the Method of weaving Sacks, &c. in the Loom above mentioned. (See Plate VII.)

L The seat of the loom.

M The treadles, six in number, to raise the harness.

N The counter-meshes to raise the tumblers O, moveable on a pin a little beyond their centre, and which act on the harness P, by raising such parts thereof as they are attached to at their extremities.

Q The work in the loom.

R The reed which strikes the shoot or weft close up.

S The back beam on which the warp or thread is wound.

T T The rods to preserve the crossing of the threads.

V The main weight suspended by a lever U, from a bar W near

its centre; the other end of the lever is fastened by a cord to the bottom frame of the loom at X.

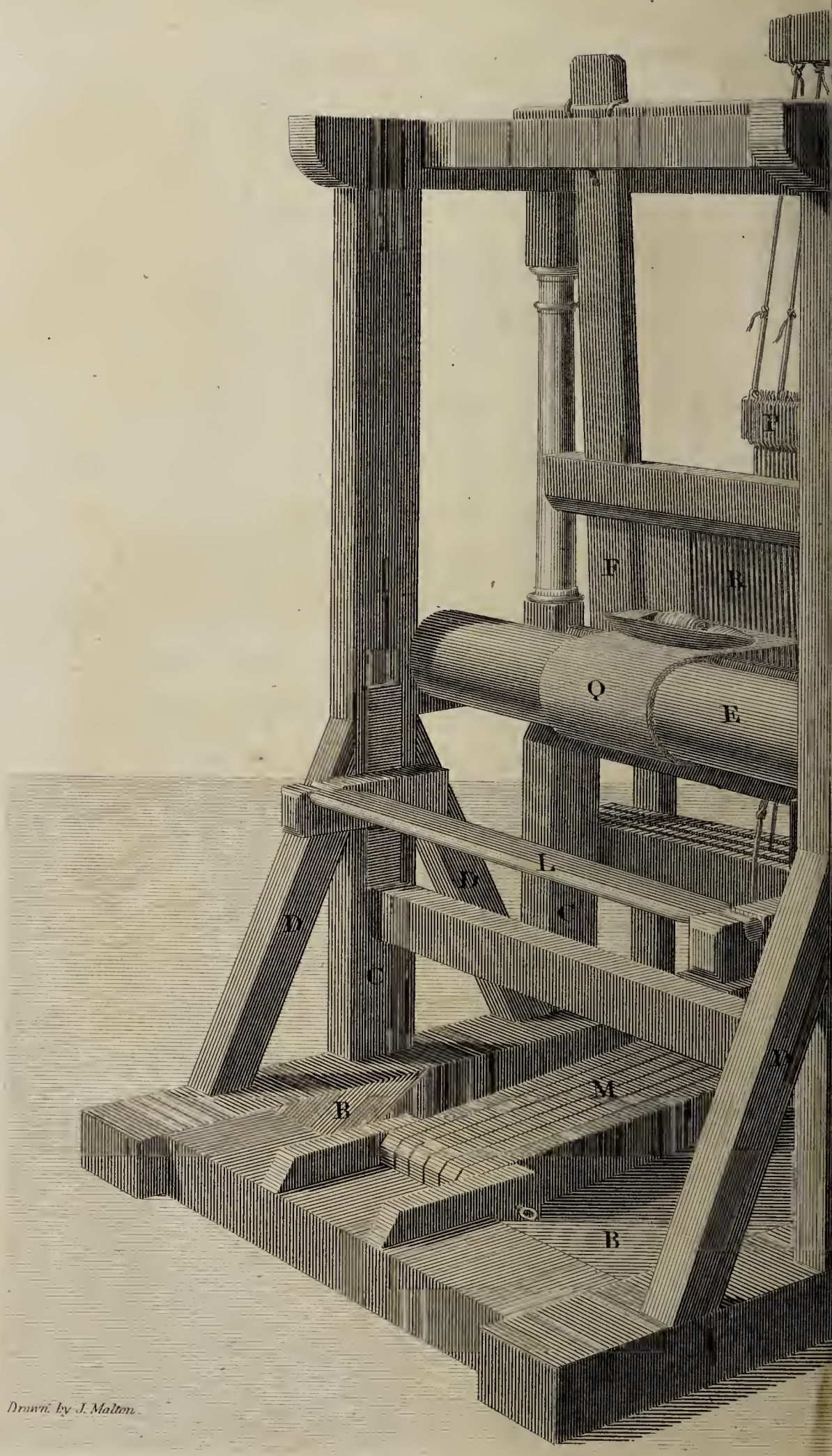
Y The rack on the working beam.

Z The catch to hold the teeth of the rack.

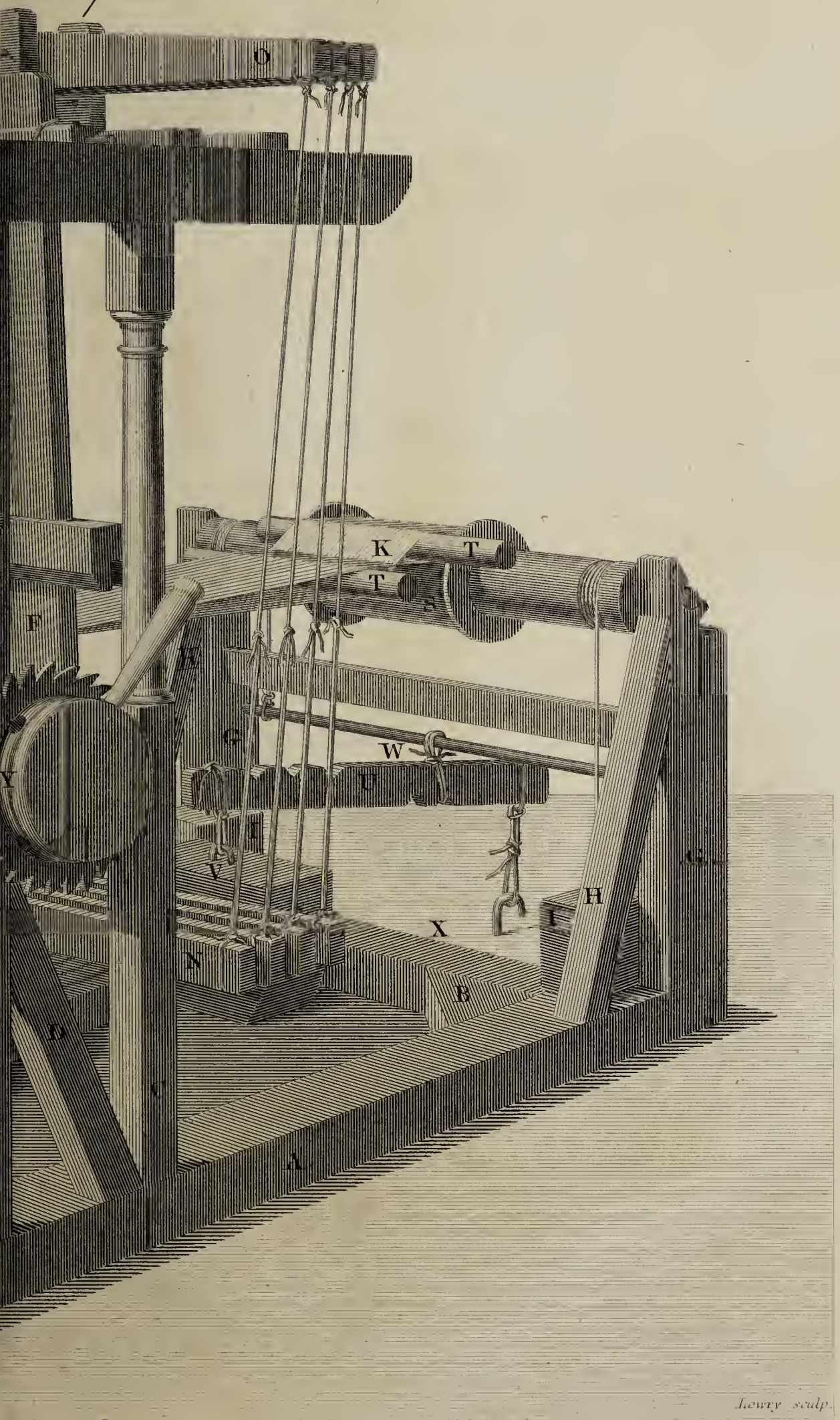
To weave a sack, press down the second treadle on the right-hand side, and throw one shoot with the shuttle; then press down the second treadle on the left-hand side, and throw another shoot; then proceed in the same manner with the third on the right, and the third on the left, till a sufficient quantity is made; then work the two outside treadles and two shoots.

In weaving sacks, it is necessary between the finishing of one sack and the commencement of another, to pass a thin slip of wood through the threads, in order to form a space between the two sacks.

Mr. Thomas Clut



Drawn by J. Malton.



Lowry sculp.

PAPERS

IN

COLONIES AND TRADE.

COLONIES AND TRADE.

The GOLD MEDAL, being the Premium offered for Plantations of BREAD-FRUIT TREES, was this Session adjudged to the Honourable JOSEPH ROBLEY, Esq. President and Commander in Chief, in and over the Island of Tobago, and its Dependencies, &c. &c. from whom the following Accounts and Certificates were received.

SIR,

IN consequence of the premium offered for the cultivation of Plantations of the Bread-Fruit Trees, in the British Colonies in the West-Indies, by the Society instituted at London, for the encouragement of Arts, Manufactures and Commerce, I have now the honour to transmit to you some papers on the

subject of such a plantation on one of my estates in this island, which I request you to lay before the Society.

As the point of land on which the trees are planted is somewhat singular, both in soil and situation, I have judged it necessary to subjoin a plan of the land, the more clearly to convey to the Society an idea of what I have described to them in the paper which accompanies this letter, and to show the motives which induced me to select this point of land, rather than any other, for this purpose; and also, from a conviction, that if the utility of such land for Bread-Fruit Trees was made public, many pieces of similar land, in our West-India Colonies, might be very profitably employed for this purpose, which at present scarcely produce any provisions, or any other product for the benefit of the owners. I therefore hope the Society will not think that my narration is tedious.

An

An awkward circumstance occurs on the present occasion, with respect to the certificate to be transmitted to the Society, from my being in command of the island; but as I judged it necessary to comply literally with the Society's advertisement, I have herewith transmitted a certificate, signed by me, in my official capacity: I have also annexed a certificate of my principal manager; and I will transmit a certificate, signed by some of the Members of Council, and the Speaker of the House of Assembly, whenever I can procure their attendance to inspect those plants.

A difficulty also occurs in sending samples of the fruit, in conformity to the advertisement of the Society, because the fruit will not keep more than two weeks after it is taken from the tree, and therefore cannot be sent to England in its natural state. I will however endeavour, by drying, pickling, or preserving in spirit, to send some fruit

for the inspection of the Society; but if I succeed in this preservation, the sending them home must of necessity be deferred, till the sailing of the ships in April next, unless an opportunity offers sooner.

As the Society are already in possession of a full and faithful description of the amazing quantity of food which the Bread-Fruit Trees produce, and of the excellent quality of that food by Dr. Anderson's letter to the Society, dated St. Vincent, 24th December, 1797, and published in the 16th Vol. of their Transactions, perhaps it is not necessary for me to say any thing on a subject so well described to them already. I will, however, so far corroborate what Dr. Anderson says, that if I may judge from the amazing quantity of fruit produced by the three trees which I have here, and which have now been in bearing these six years, I am of opinion, that when the whole of the point of land

is

is planted, it will contain about 1300 trees; and I think it will be equal to the support, in the Bread-Fruit kind of provision, of nearly a thousand negroes, which I have on this and two neighbouring estates.

I am, SIR,

Your most obedient humble Servant,

JOSEPH ROBLEY.

Tobago Golden-Grove,
25th Aug. 1801.

MR. CHARLES TAYLOR.

SIR,

HAVING written to you before on the subject of a plantation of Bread-Fruit Trees on one of my estates, called Golden Grove, in the parish of St. Patrick, in the island of Tobago, I shall now proceed to describe the point of land on which I have placed those trees,

in

in the manner described in the annexed plan.

This point of land is bounded on one side by a beautiful salt-water lagoon, and at the east end it is bounded by a steep bank of lime-stone rock, in some places mixed with a loose dry soil. The bank is about fourteen feet high, stretches from the lagoon to the sea, and completely fences in and secures the point of land to the eastward, from whence our trade winds generally blow. This point of land communicates with the estate, by means of a gate placed between the lagoon and the steep bank; so that it is wholly and completely fenced in by the lagoon, the sea, and this steep bank. It is likewise nearly perfectly level, and consists of a loose sandy soil; and when the tide is in, water is to be found in every part of it, at the depth of about two feet and a half from the surface; this water, though brackish, is drinkable. Having read all the late

voyages

voyages to the South-Sea Islands, I always observed in them, that the Bread-Fruit Trees were described as principally growing in low situations, near the sea, from which I first formed my opinion, that this point of land was well adapted for their culture; and in consequence of this idea, I had a very ardent desire to obtain some plants, in order to try the experiment.

In 1792, a vessel arrived at Martinique, from the Isle of France, with several plants, which were said to be of the true Otaheite Bread-Fruit; in consequence of which I sent to Martinique, and eagerly purchased some of them; but, to my very great disappointment, I found, when they came to bear, that all of them were of that sort only, which produces nuts: but my chagrin on this occasion was soon relieved, by the arrival of Capt. Bligh, at St. Vincent, in his Majesty's ship the Providence, in 1793, with many plants of the true Otaheite Bread-

Bread-Fruit, some of which were landed at St. Vincent, and placed under the care of Dr. Anderson, who has the charge of the Botanic Garden there, and who, with great kindness, sent me three of those plants in June 1793. These three plants I planted in a garden near my mansion-house, in a very deep, rich, black soil, where I paid every possible attention to them, in the hope of procuring an abundance of suckers for my favourite point of land: they flourished exceedingly, and produced fruit in 1795; and these three trees still continue to flourish and bear fruit in great abundance. Till last year, however, I could not obtain even one sucker from them; in consequence of which, I wrote to Dr. Anderson on the subject, who advised me to remove the earth from above the uppermost roots, and to wound and even cut some of them in half. I followed his advice, and laid bare many of the roots,

and

and bisected them in October 1800, when they almost immediately began to shoot suckers in abundance; insomuch, that in December I had about 120 fine plants, which I planted in small wicker baskets, of about a gallon in size, first filling them with good rich loose soil: those baskets I placed in the shade, and near the water, with which I supplied them whenever the weather required it; and here I kept them during the dry season. I preferred placing the plants in baskets, to placing them in pots, because they are lighter, and are more easily removed from one place to another; and also because, when they are to be planted out in the land in which they are to remain, by planting the baskets with the plant in it, the plant will not be at all checked in its growth, as the baskets will soon rot in the ground, so that the roots of the plant easily extend themselves in the adjacent soil, without impediment. From this great and unexpected success in procuring

curing plants, I began very seriously to think of preparing the land at the Point for their reception; and as my visits to the Point were consequently very frequent, I perceived, that at very high tides the salt water flowed into some part of the land, on the lagoon side of it. In order, therefore, to guard against any ill consequence from this circumstance, I immediately formed a bank all round the lagoon side, for about three quarters of a mile in length, ten feet in breadth, and three feet in height, towards the land side, and shelving gradually to the water. This bank I formed of mud mixed with sand, and it is now perfectly solid, and water tight; and the influx of the sea has formed a very regular and easy sandy beach, all the way on the outside of the bank.

My next step was to plough one half of this point, in order to clear it of every noxious weed; for which purpose I ploughed it twice, and harrowed it

twice

twice over; I then divided it into beds of 27 feet in breadth across the point, from the sea to the lagoon, and planted my plants in the middle of each bed, at the exact distance of 27 feet every way. I have already said, that brackish water was to be found all over this point at high water, at about $2\frac{1}{2}$ feet from the surface; and for some time, this circumstance made me uneasy, lest the brackish water should injure the trees, when their roots came to touch it; but accidentally reading a translation of Monsieur Labillardiere's voyage, in search of La Perouse, published by Stockdale in 1800, I met with the following remark, vol. 2, p. 105. "We walked some "time (says he) along the borders of "the shore, on which we saw a great "number of Bread-Fruit Trees in full "vigour, although their roots were "bathed with brackish water." Some time previous to reading this remark, I had tried the experiment, by taking a part

part of this point into a garden and pinery, in which I also planted about ten of my most forward Bread-Fruit Plants, and where they flourish and grow faster than in any other place I have yet seen. The garden and pinery also flourish admirably, which I attribute to the loose sandy texture of the soil, which absorbs any water immediately, and of course prevents any damage from excessive rains. In the dryest season, too, the garden is equally flourishing, as in rainy weather, by the rays of the sun drawing the water through this loose soil, for the nourishment of vegetables; so that what I had dreaded as an evil, proves to be of the greatest advantage, and produces a spot of land, of about 45 acres, which is regularly watered twice in twenty-four hours, in all seasons, and without any expense. When I considered the lively interest which the Society have taken, in being the first to recommend the procuring the plants of

Bread

Bread Fruit, from the South-Sea Islands to those of the West Indies, for the benefit of their inhabitants; I determined to send those papers immediately to the Society, though my Bread-Fruit Plantation is but in its infancy, and only yet contains 153 plants; but which, when completed, will contain 1800, or thereabout. I cannot reckon on more than 20 plants per month from the roots of my three old trees; but when those I have now planted begin to sucker, any number may be obtained, so as to complete the point of land in a short time.

I hope the detailed account I have now given of the Bread-Fruit Plants, and of the situation in which I have placed them, will prove satisfactory: and as I observe that there has been only one claim for a plantation of Bread-Fruit Trees, and that from Jamaica, in 1798, if it shall appear to the Society that, from the numbers I have now planted, and which I am increasing every

month, I am entitled to any premium, I shall esteem it an honour to receive it.

I am, SIR,

Your most obedient Servant,

JOSEPH ROBLEY.

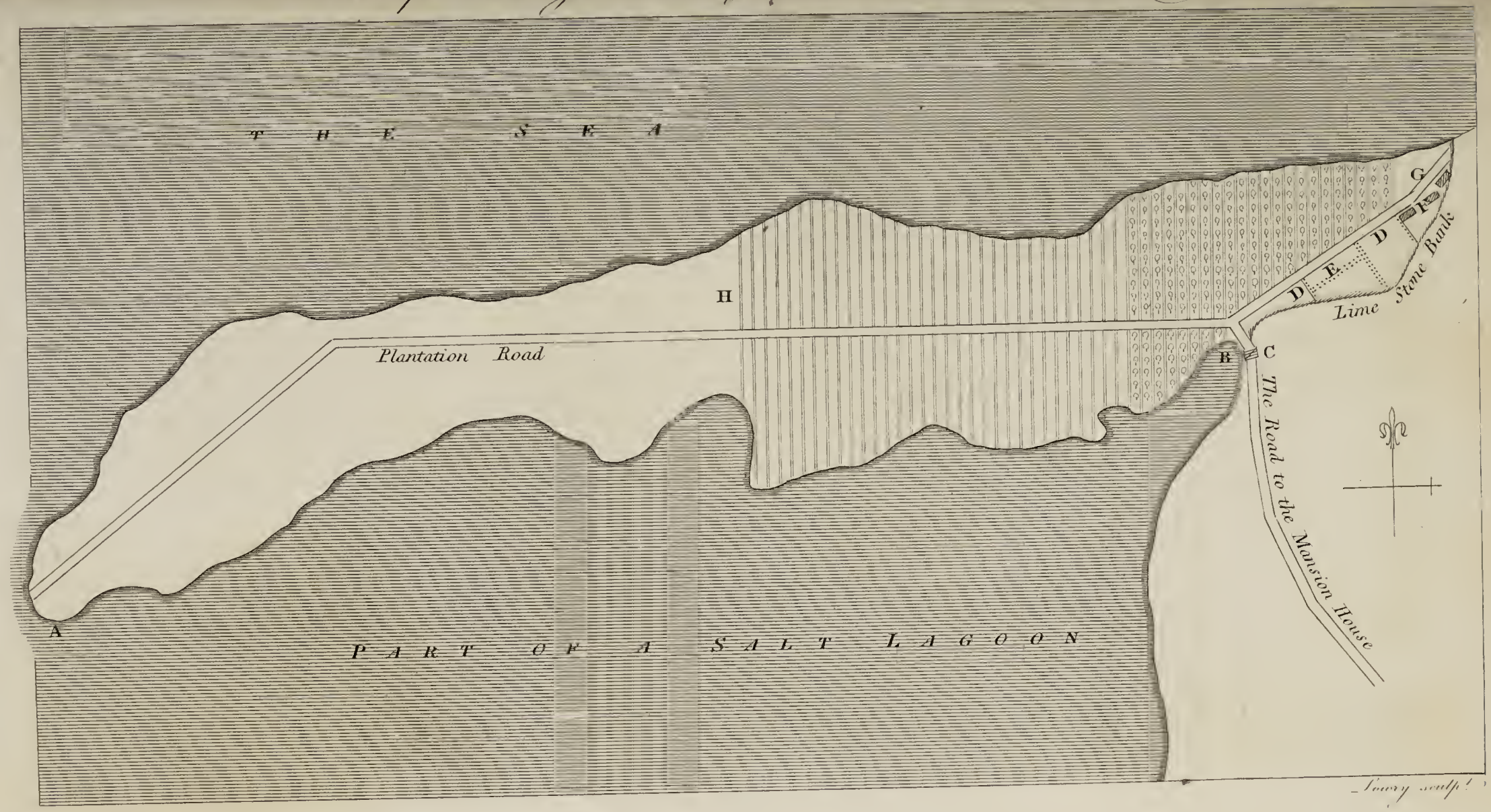
Tobago, Golden-Grove,
25th Aug. 1801.

To Mr. CHARLES TAYLOR.

Certificates from the Governor of the Island, from R. Robertson and Charles Wightman, Esqrs. Members of the Council, from Robert Paterson, Esq. Speaker of the Assembly, and from Mr. George Lyall, principal Manager of the Honourable President Robley's estates, accompanied these Papers, confirming the above statement, that 153 plants are now growing in a flourishing state, and are completely fenced in and protected.

The

Part of the Golden Grove Estate in Tobago.



The GOLD MEDAL of the Society was this Session voted to Dr. ANDERSON, of St. Vincent, for the following Communications on CLOVES and CINNAMON produced in that Island. Specimens of the Articles sent are preserved in the Society's Repository, for the inspection of the Public; and a coloured Engraving of the Clove Plant is here annexed to its Description.

Observations on the Clove Plant at St. Vincent, and the Cloves sent from thence to the Society.

SIR,

IF you conceive the specimens of Cloves accompanying this letter (being the first produced in the garden), with some observations on the plant,

merit the attention of the Society, you will do me the honour to present them.

I am, SIR,

Your most obedient Servant,

ALEX. ANDERSON.

Botanical Garden, St. Vincent,
April 23, 1800.

To the Secretary of the
Society of Arts, &c.

THE Clove is an elegant little tree: that in the garden now bearing, is about eight feet in height, and the stem, near the ground, is about two inches in diameter. That so small a tree should bear fruit, I ascribe to its being from a layer. The nature of the plant is not yet well known in the West Indies; all the information I have heretofore received as to the culture of it, has been

been for the most part from ignorance, or from ill intentions; and consequently has led me into errors on that subject, by which I have often lost the original plant: but I have always been so fortunate as to preserve an offspring by layers.

From the difficulty of preserving the plants, it naturally occurred to me, that I had adopted a soil not congenial to them, as I find that all other East-India plants thrive luxuriantly in the garden; and am by no means ignorant, that all plants, although originally from a barren soil, always prosper best in a rich one, when transplanted from their natural situation. I therefore tried them in the best soil I could select, adding thereto plenty of manure; at the same time, I also planted others of the same age and size in various other soils, without manure. The consequence has been, that those in the manured soil are thriving luxuriantly, of which that now bearing

is one; while the others have failed, or are so sickly, that they never will arrive at maturity.

Since this, I have fortunately met with the *Herbarium Amboinense* of Rumphius, and find that he corroborates my idea.

It is a plant that loves the shelter of other trees to windward of it, but not so as to overshade it, as Rumphius observes. When fully exposed to the wind, it does not answer so well; but rich land, or manure in bad land, is what will answer best with it.

It is propagated by laying down the young branches in boxes, or in the ground, if they can be brought in contact with it. If the earth is kept moist, they will root in six months.

I suspect that the best mode in rearing it from seeds, is to put them in the earth where the plants are to remain; and if planted in the manner of a thicket, or from eight to ten feet apart, they

they will prosper better than when farther separated or scattered. This I find to be the case with most plants of the same species.

As all botanical descriptions of the Clove appear to me to be imperfect, at least agree not with the plant that has flowered in the garden, I have ventured to inclose an account of the fructification as the parts appeared to me. There are probably more than one species, as Rumphius's figures of it differ.

The specimens of the spice which I have sent are dried by various modes, some according to the directions of Rumphius; by some of the processes, they are larger than by others. Whether that may be the only advantage gained, or which is the best mode of curing it, rests with the Society to determine. It is to be observed, that every part of the plant, in an eminent degree, possesses the same property as to taste. All these specimens are gathered in the same

stage, viz. when the flower-bud appears entirely red, which is when the corolla begins to rise previously to its falling off. This happens at sun-set. The morning of the same day is the proper time to collect them for drying. There is something very singular as to the formation of the flowers. In September, 1799, clusters of them were so far formed, that I looked for their expansion every day; none of them however opened till the March following, a period of six months. I began to imagine that, from the smallness of the plant, it had not sufficient vigour to bring them to maturity. However, I was agreeably disappointed; scarcely more than two flowers, and frequently only one, expands in the same day. To have the spice therefore in perfection, it is requisite to go over them every morning, collecting those that have the appearance of opening in the evening.

The leaves are a good substitute for the fruit, for culinary purposes.

CARYO-

CARYOPHYLLUS AROMATICUS. CLOVE.

Perianthium quadripartitum, laciniæ ovatæ, concavæ, persistentes.

Petala quatuor ovata, sessilia, conniventia, clausa, caduca.

Nectarium tetragonum integerrimum, concavum, apicem germinis ringens.

Filamenta numerosa subulata, in base calycis inserta, antheræ ovatæ, erectæ, bilocularios.

Germen inferum, clavatum—Stylus subulatus, filamentis brevior. Stigma obtusum, drupa ovato-turbinata, calyce incrassato coronata.

Nux oblonga, glabra, unilocularis.

REFERENCES TO THE ANNEXED COLOURED ENGRAVING.

No. 1. The natural size of the flower, and mode of its inflorescence.

2. The

2. The rudiment of the fruit in a longitudinal section, to show the insertion of the stamina.
3. The petals cohering; the stamina gradually raising them.
4. The petals ready to fall off.
5. The petals as they fall off adhering in a calyptra.
6. The natural size of one of the petals.
7. The fruit nearly ripe.
8. Longitudinal section through the middle.

*** From examination of the specimens of the Cloves sent, before a Committee appointed by the Society, it appeared that those dried in the smoke were damaged by it; that those dried in the sun were but of an indifferent quality; but that the Cloves dried in the shade were very little inferior to those produced in the East Indies, and well worth encouragement.

Observations

Observations on the Cinnamon from St. Vincent.

SIR,

AS the small quantity of Cinnamon I had the honour of sending to the Society last year, was insufficient to form a just idea as to its quality, I now send a large parcel in a box, dried at different times, and taken from branches of young trees of different ages; from which, it is hoped, the Society will be able to judge of the quality, and to decide which is the most proper period for taking it off, and the best mode of drying it. I am, with great respect,

SIR,

Your obedient humble Servant,

ALEXANDER ANDERSON.

Botanical Garden, St. Vincent, July 20, 1800.

To the Secretary of the Society of Arts, &c.

*** The

*** The quantity of Cinnamon sent from Dr. Anderson appears to have been originally more than twenty pounds in weight; but the package had been opened at the Custom-House, and the samples intermixed, so as not to permit the Society to recognize the particular distinctions noticed by Dr. Anderson: there was, however, an evident difference in some of the samples, in respect to appearance, taste, and smell; they were found generally to be inferior to East-India Cinnamon, but much superior to Cassia.

A further account of the varieties of the Cinnamon-plant, and some observations on the Clove-plant, relative to their state in the garden of St. Vincent, in the year 1798, from a communication by Dr. Anderson to the Society, may be found in the XVIth Volume of the Society's Transactions, p. 333.

6
5
2
4
3

Engraved by Syd. Edwards

REWARDS

BESTOWED BY THE

SOCIETY,

From October, 1801,

To June, 1802.

Society of Arts, Manufactures, and Commerce.

ON Wednesday, the 2d of June, the Society held the last Meeting of that Session, and adjourned to the fourth Wednesday in October next.

On Tuesday, the 25th of May last, agreeably to the Resolutions of the Society, the Premiums and Bounties which had been then adjudged during the Session, were delivered to the Claimants from the Chair, by his Grace the Duke of Norfolk, the President, in the presence of a very numerous and respectable Assembly. The business was begun by an appropriate Speech from the Secretary, noticing the objects of the Society, from its institution in the year 1753, to the present time, and particularising the Rewards which had been then adjudged this Session.

The

The Rewards conferred are arranged under the following Classes:

IN AGRICULTURE.

To JAMES HUNTER, Esq. of Gubbins, in Hertfordshire, for having planted 40,000 Oaks, the GOLD MEDAL, Class 11, Vol. XVIII. See page 77.

To the Rev. RICHARD YATES, of Chelsea, for his Essay on raising and promoting the Growth of OAKS, the SILVER MEDAL. See page 80.

To JOHN CHRISTIAN CURWEN, Esq. of Workington Hall, in Cumberland, for having planted 84,900 Larch Trees, the GOLD MEDAL, Class 35. Vol. XVIII. See page 96.

To HENRY VERNON, Esq. of Hilton Park, near Wolverhampton, for planting 10,000 Silver Firs, the GOLD MEDAL. Class 45. Vol. XVIII. See page 101.

To Mr. FREDERICK CLIFFORD CHERRY, of New Wood Farm, near Stoke D'Aubernon, in Surry, for planting

ing 60 Acres with Osiers, the sum of THIRTY GUINEAS. Class 6. See page 104.

To Mr. SETH BULL, of Ely, in Cambridgeshire, for planting eight Acres with Osiers, the Sum of TEN GUINEAS. Class 7. See page 111.

To CHARLES GIBSON, Esq. of Quermore Park, near Lancaster, for planting 6,000 Elms, the SILVER MEDAL. Class 27. Vol. XVIII. See page 115.

To ROBERT BROWN, Esq. of Markle, near Hadington, in Scotland, for his culture of Beans and Wheat in one year on the same Land, the SILVER MEDAL. See page 123.

To WILLIAM FAIRMAN, Esq. of Miller's House, near Sittingbourn, in Kent, for his Experiments on Extreme Branch Grafting of Fruit-trees, the SILVER MEDAL. See page 168.

To THOMAS JOHNES, Esq. of Hafod, in Cardiganshire, for having planted 400,000 Forest-trees, the GOLD MEDAL. Class 63. Vol. XVIII. See page 182.

To James Beech, Esq. of Shaw, near Cheadle, in Staffordshire, for his plantation of Timber-trees, the Silver Medal. See page 191.

IN CHEMISTRY.

To Mr. Thomas Willis, of Lime-street, London, for his preparation of the Bulbs of the Hyacinthus non scriptus, or common Field Blue-Bells, as a substitute for Gum Arabic, the Silver Medal. See page 201.

IN POLITE ARTS.

To George William Gent, Esq. of Upper Guildford-street, for a Drawing of Lewes Castle in Sussex, the Gold Medal. Class 89.

To Miss Elizabeth Mac Dowall, of Brook-street, Holborn, for a Chalk Drawing of the Virgin and Child, the Gold Medal. Class 91.

To Miss Winifred Barrett, of Stockwell, in Surry, for a Drawing of a Land-

Landscape, the SILVER MEDAL. Class 91*.

To Miss JACKSON, of Hanover-street, for a Drawing in Black Chalk, after an Engraving by BARTOLOZZI, the SILVER MEDAL.

To Miss BLACKBURNE, of Park-street, Westminster, for a Drawing of Demosthenes, from a Bust, the SILVER MEDAL.

To Miss MARY ANNE GILBERT, of Devonshire-street, Portland-place, for a Miniature Drawing of an Old Woman, after Nature, the SILVER MEDAL.

To Miss EMMA FARHILL, of Mortimer-street, Cavendish-square, for a Drawing of Peasants in a Storm, the SILVER MEDAL.

To WILLIAM STONE LEWIS, Esq. of High Holborn, for a Drawing of Outlines of the Laocoon, from a Cast, the larger SILVER PALLET. Class 92.

To GEORGE JONES, Esq. of Great Portland-street, Mary-le-bone, for a

Drawing of Outlines of Hercules and Antæus, from a Cast, the lesser SILVER PALLET. Class 93.

To RICHARD SPEARE, Esq. of Dean-street, Soho, for a Drawing, a View at Eltham in Kent, the greater SILVER PALLET. Class 94.

To Mr. RICHARD COOK, of Upper Charlotte-street, Fitzroy-square, for a Drawing of Mutius Scævola before Porsenna, the GOLD PALLET. Class 96.

To Mr. C. NESBIT, of Fetter-lane, for Engravings on Wood, the SILVER MEDAL. Class 103.

To Mr. RICHARD AUSTIN, of Paul's-alley, Barbican, for Engravings on Wood, the SILVER MEDAL. Class 103.

To Mrs. ELIZABETH COPPINS, of St. Stephen's, Norwich, for a Drawing in Crayons of Belisarius, copied from a Painting of Salvator Rosa, the greater SILVER PALLET.

To Miss FRANCES TALBOT, of Wymondham, Norfolk, for a Painting of a

Herb

Herb Girl, from Nature, the SILVER MEDAL.

To Miss BEAUCHAMP, of Langley Park, near Beccles, in Suffolk, for a Painting of a Landscape, copied from Both, the SILVER MEDAL.

To Dr. EVANS, for his Map of North Wales, FORTY-FIVE GUINEAS.

IN MANUFACTURES.

To Mr. THOMAS CLULOW, of Shoreditch, for his invention of weaving Purses, Pockets, and Sacks, in a Loom, and improving the construction of Looms in general, TWENTY-FIVE GUINEAS.

IN MECHANICKS.

To Mr. HENRY GREATHEAD, of South Shields, in the Bishoprick of Durham, for his construction of a Cork Boat, by which the lives of many persons shipwrecked have been preserved,

the GOLD MEDAL and FIFTY GUINEAS.

To Mr. RICHARD KNIGHT, of Foster-Lane, Cheapside, for his method of clearing Land from Stumps of Trees, and rendering them in a proper state for Fuel, the SILVER MEDAL. See page 247.

To Mr. JAMES BROWNHILL, of Alloa Mills, near Stirling, in Scotland, for his discovery of a Quarry of Stone, proper for making Mill Stones, ONE HUNDRED POUNDS. See page 271.

To Mr. JAMES WOART, of Fulham, for securing Beams of Timber decayed by the dry rot, or injured by accidents in buildings, the sum of TEN GUINEAS, See page 258.

To Mr. JOHN WEBB, of Dorrington Street, London, for his improvement of a Gun Lock, TWENTY GUINEAS. See page 243.

IN

IN COLONIES AND TRADE.

To Dr. ALEXANDER ANDERSON, of St. Vincent, for the culture of Cloves and Cinnamon, the GOLD MEDAL.

To the Honourable JOSEPH ROBLEY, of Tobago, for a plantation of Bread Fruit Trees, the GOLD MEDAL.

PRESENTS

RECEIVED BY THE

SOCIETY,

SINCE THE PUBLICATION OF THE NINETEENTH VOLUME OF THESE TRANSACTIONS.

With the Names of the Donors.

The Royal Society.

THE sequel to the 90th Volume of the Philosophical Transactions. Quarto.

The Society of Antiquarians.

An Account of the Durham Cathedral.

The

THE ROYAL BRITISH INSTITUTION.

The Journals of the Royal Institution, from the 1st to the 12th inclusive. Octavo.

Lectures on Chemistry, by Mr. Davey.

Lectures in Natural and Experimental Philosophy, by Mr. Young.

THE DUBLIN SOCIETY.

The 1st, 2d and 3d Volumes of the Transactions of the Dublin Society. Octavo.

A Statistical Survey of the County of Wicklow.

A Statistical Survey of the County of Leitrim.

15 Copies of Essays on the Culture of Potatoes, from their Shoots, by Dr. Maunsell.

A Pamphlet on the Culture of Barilla.

THE LINNÆAN SOCIETY.

The Sixth Volume of their Transactions. Quarto.

THE

THE BOARD OF AGRICULTURE.

Three Volumes, including Vol. 1 and 2, and Vol. 3, Part 1, of Communications to that Board. Quarto.

AMERICAN PHILOSOPHICAL SOCIETY at PHILADELPHIA.

Vol. 2, 3, and 4, of their Transactions. Quarto.

THE MANCHESTER LITERARY and PHILOSOPHICAL SOCIETY.

Six Volumes of their Memoirs, containing from Vol. 1 to Vol. 5, Part 2, inclusive. Octavo.

THE MANCHESTER AGRICULTURAL SOCIETY.

Their Rules and Conditions for 1802.

SOCIETY FOR BETTERING THE CONDITION OF THE POOR.

The 15th and 16th Reports of the Society, presented by Dr. Garthshore from the Committee. Octavo.

The

THE COMMITTEE OF WAREHOUSES OF THE HONOURABLE EAST-INDIA COMPANY, BY R. WISSETT, ESQ.

Nos 2, 3, and 4, of the Plants of the Coast of Coromandel. Folio.

N° 2 of Descriptions of India Serpents. Folio.

Dr. JAMES ANDERSON.

The 6th Volume of Recreations in Agriculture. Octavo.

N. ATCHESON, Esq.

A Letter on the State of the carrying part of the Coal Trade.

Dr. DANCER, of Jamaica.

The Medical Assistant, or Jamaica Practice of Physic.

WILLIAM FORSYTH, Esq.

A Treatise on Fruit-Trees. Quarto.

JOHN

JOHN HINCKLEY, Esq.

Link's Statistical Travels in Portugal.

Dr. LETTSOM.

Hints to promote Beneficence, Temperance, and Medical Science. 3 Volumes, octavo.

Observations on the Cow Pock.

SIR ALEXANDER MACKENZIE.

Voyages from Montreal, on the River St. Lawrence, through the Continent of North America, to the Frozen and Pacific Oceans. Quarto.

Dr. POWELL.

Observations on the Bile and its Diseases. Octavo.

CITOYEN PUGH.

Observations sur le Pesanteur de l'Atmosphère.

T. N.

T. N. Parker, Esq.

A Practical Enquiry, concerning hanging and fastening Gates and Wickets. Octavo, with Models of Iron Work proper for the purpose.

Monsieur J. C. L. Simonde.

Tableau de l'Agriculture Toscane. Octavo.

Sir John Sinclair, Bart.

Ten Quarto Pamphlets, entitled, "Observations on the Manner of enabling Cottagers to keep a Cow."

Colonel William Tatham.

A Bust of General Washington.

Communications concerning the Agriculture and Commerce of the United States of America. Octavo.

On the Labour of Oxen compared with Horses. Octavo.

On the Culture and Commerce of Tobacco. Octavo.

National

National Irrigation, or the various Methods of watering Meadows. Octavo.

On the Political Economy of Inland Navigation. Quarto.

WILLIAM HALL TIMBRELL, Esq.

New Inventions and Directions for Ruptured Persons.

Appendix to Ditto. Octavo.

ARTHUR YOUNG, Esq.

214 Numbers of the Annals of Agriculture. Octavo.

Letters from General Washington to Arthur Young, Esq. Octavo.

A CATALOGUE

OF THE

MODELS AND MACHINES

Received since the Publication of the Nineteenth Volume of the Society's Transactions; with the Numbers as they are arranged, in the Class to which they belong.

AGRICULTURE. CLASS I.

No. XCII. A BRANCH of a Tree engrafted by William Fairman, Esq. See page 168.

MANU-

MANUFACTURES. CLASS III.

XXXIV. A Model of an improved Loom, and method of weaving Sacks, by Mr. Thomas Clulow. See page 353.

MECHANICKS. CLASS IV.

CXCIII. A Gun, with a particular Lock, to prevent the unexpected discharge of Fire-arms, by Mr. John Webb. See page 243.

CXCIV. An Augre, Gauge, and Blasting-Screw, by Mr. Richard Knight. See page 247.

CXCV. A Model of a Method to secure decayed Girders, by Mr. James Woart. See page 258.

CXCVI. Ditto, by Ditto. See page 267.

CXCVII. A Model of a Life-Boat, by Mr. Henry Greathead. See page 283.

CXCVIII. A Model of a part of the Human Body, with a Truss and Cushion, by W. H. Timbrel. See page 331.

CXCIX. A Model of Iron-work for hanging Gates and Wickets, by T. N. Parker, Esq.

COLONIES and TRADE.

A dried Bread-Fruit, from Joseph Robley, Esq. See page 357.

Cloves and Cinnamon, from Dr. Anderson, of St. Vincent. See page 371.

A LIST

OF THE

OFFICERS of the SOCIETY,

AND

CHAIRMEN

OF THE SEVERAL

COMMITTEES,

Elected March 23, 1802.

PRESIDENT.

CHARLES Duke of Norfolk, F. R. and A. S.

VICE-PRESIDENTS.

Charles Duke of Richmond, K. G. F. R. and A. S.

William Henry Duke of Portland, K. G. F. R. and A. S.

Hugh Duke of Northumberland, K. G. F. R. and A. S.
Jacob Earl of Radnor, F. R. and A. S.
Charles Earl of Liverpool, LL. D.
Charles Earl of Romney, F. R. S.
Hon. Robert Clifford, F. R. and A. S.
Sir William Dolben, Bart.
Sir Watkin Lewes, Knt.
Thomas Pitt, Esq. F. A. S.
Caleb Whitefoord, Esq. F. R. and A. S.
Thomas Skip Dyot Bucknall, Esq.

SECRETARY.

Mr. Charles Taylor.

ASSISTANT-SECRETARY.

Mr. Thomas Taylor.

HOUSEKEEPER.

Miss A. B. Cockings.

COLLECTOR.

Mr. Stephen Theodore Borman.

CHAIR-

CHAIRMEN OF THE SEVERAL COMMITTEES.

Elected March 23, 1802.

ACCOMPTS.

James Hebert, Esq.
William Lumley, Esq.

CORRESPONDENCE AND PAPERS.

Edward Bancroft, M. D. F. R. S.
Richard Powell, M. D.

POLITE ARTS.

Matthew Michell, Esq.
George Meredith, Esq. F.A.S. P.R.I.

AGRICULTURE.

John Middleton, Esq.
Matthias Deane, Esq.

MANUFACTURES.

Mr. Joseph Champney
Mr. J. Pearsall

MECHANICKS.

George Howe Browne, Esq.
Thomas Day, Esq.

CHEMISTRY.

Edward Howard, Esq. F. R. S.
Henry Coxwell, Esq.

COLONIES AND TRADE.

William Meredith, Esq.
Joseph Colen, Esq.

MISCELLANEOUS MATTERS.

Joseph Jacob, Esq.
William Kirkby, Esq.

A

LIST

OF

CONTRIBUTING MEMBERS.

NOVEMBER, 1802.

N. B. Thoſe marked with ** pay Five Guineas annually; those marked with *, Three Guineas annually; those with P, are Perpetual Members; those with †† have served the office of Steward; and those marked with † are Stewards elect.

A.

* ARGYLL, John Duke of
Athol, John Duke of, F. R. S.
Anspach, Elizabeth Margravine of Brandenburgh
Alvanley, Richard Lord, *Great George-street*
††Anderson, Sir John William, Bart. M. P. *Adelphi Terrace*
Aſtley, Sir Jacob Henry, Bart. M. P. *Burgh Hall, Norfolk*

††P Abbot, Charles, Esq. *Pall-mall*, M. P. F. R. and A. S.

Abercromby, John, Esq. *Claygate, near Esher, Surrey*

Abdy, Rev. Thomas Abdy, *Cooper-sale, Essex*

Ablett, Joseph, Esq. *Manchester*

Adair, Alexander, Esq. *Pall-mall*

††Adam, William, Esq. *Albemarle-street*

Adam, William, Esq. *Lincoln's-inn-fields*

Adam, Joseph, M. D.

Adams, William, Esq. M. P. *Craven-street*

Adams, John, Esq. *Ely-place*

Adams, Dudley, Esq. *Fleet-street*

Adamſon, Mr. David, *Oxford-street*

Affleck, Col. James, *Vere-street, Cavendish-square*

Agace, Daniel, Eſq. *Gower-street*

Aickin, James, Esq. *Denmark-street, Soho*

Ainslie, Henry, M. D. *Dover-street*

Ainsworth, Mr. Richard, *Moss Bank, near Bolton*

Albin, William, Esq. *Tokenhouse-yard*

P Alexander, Claud, Esq.

††Alexander, Mr. Daniel, *Lawrence-Poultney-lane*

††Allen, Edward, Esq. *Clifford's-inn*

††Allen, John, Esq. F. R. S. *Clement's-inn*

††Allen, William, Esq. *Lewisham, Kent*

Allix, John Peter, Esq. *Swaffham-house, Cambridgeshire*

Anderson, David, Esq.

Anderson, James, LL. D. *Isleworth.*

P Andrew, Thomas Harrison, Esq. *Moss-hall, Finchley*

Andrews, Magnus, Esq. *Sackville-street, Piccadilly*

Andrews,

Andrews, Thomas, Esq. *Gray's-inn*
Angerstein, John Julius, Esq. *Pall-mall*
P Annesly, Honourable Richard, *Dublin*
P Antrobus, Edmund, Esq. *New-street, Spring-gardens*
Arbuthnot, George, Esq. *King-street, Golden-square*
Arkwright, Richard, Esq. *Cromford, Derbyshire*
Armstrong, Mr. John, *Pimlico*
Arnoldi, Mr. George, No. 3, *Church-yard-court, Temple*
P Ashby, Shuckbrugh, Esq. F. R. S. *Great Ormond-street*
Ashby, Henry, Esq. *St. Andrew's court, Holborn*
Ashton, Nicholas, Esq. *Woolton Hall, near Liverpool*
Ashton, Mr. Isaac, *Billiter-lane*
Aslet, Mr. Robert, *Bank, and Gracechurch-street*
††Atcheson, Nathaniel, Esq. F. S. A. P. R. I. *Ely-place*
††Atlee, Mr. John, *Wandsworth*
††Atlee, Mr. James, *Thames-street*
††PAubert, Alexander, Esq. F. R. and A. S. *Austin-friars*
Aubyn, James St. Esq. *Plymouth-dock*

B.

**Buccleugh, Henry Duke of
P Bute, John Earl of, F. A. S.
P Buchan, David Earl of, LL. D. F. R. and A. S.
Bristol, Right Rev. Frederick Earl of, F. R. S.

Barrington,

Barrington, the Right-Hon. Lord Viscount
P Beverley, Algernon Earl of
P Brownlow, Lord, F. R. and A. S.
Braybrooke, Richard Lord, *Lower Grosvenor-street*
Bolton, Thomas Lord, F. A. S.
P Balgonie, Lord
P Bouillon, Prince of, Philip D'Auvergne, Captain in the Royal Navy, F. R. and A. S.
Bruhl, his Excellency Count de, *Old Burlington-street*
Bruce, the Honourable Major-General, M. P.
Bowes, the Honourable George
Bowes, the Honourable Thomas, *Redbourn, near St. Alban's*
P Blacket, Sir Thomas, Bart.
Banks, the Right Honourable Sir Joseph, Bart. President of the Royal Society, K. B. and F. A. S. *Soho-square*
Baring, Sir Francis, Bart. M. P. *Devonshire-square*
Burgess, Sir James Bland, Bart. *Duke-street, Westminster*
Bruce, Governor James
††P Bacon, John, Esq. F. A. S. *Temple*
P Bacon, John, Esq. *Newman-street*
††Bacon, Anthony, Esq. *Newtown, near Newbury*
Bailey, Charles, Esq. *Swallowfield, Berks*
Bailey, James, Esq. *Lambeth*
††Baker, John, Esq. 12, *Grosvenor-street*
P Baker, William, Esq. *ditto*
Baldwin, Mr. Charles, *Union-street, Blackfriars*
Bancroft,

Bancroft, Edward, M. D. and F. R. S. *Francis-street, Tottenham-court-road*

Barber, John Thomas, Esq. *Southampton-street, Covent-garden*

P Barclay, David, Esq. *Walthamstow*

Barclay, Robert, Esq. F. L. S. *Terrace, Clapham*

* Barclay, Robert, Esq. *Lombard-street*

Baring, John, Esq. M. P. *Charles-street, Berkeley-square*

Barker, Richard, Esq. *Tavistock-street, Bedford-square*

Barker, Mr. Charles, *Chandos-street*

Barlow, Mr. J. *Great Surrey-street, Blackfriars*

P Barnard, William, Esq. *Deptford*

P Barnard, Edward, Esq. *ditto*

Barnard, Mr. Thomas, *Adelphi*

Barnard, Josiah, Esq. *Cornhill*

Barnard, Leonard, Esq. *Old Jewry*

†† Barnardiston, Nathaniel, Esq. *Harpur-street*

Barnet, Edward, Esq. *Soho-square*

Barrett, Miss Eliza, *Stockwell*

Barrington, the Rev. George, *Durham*

Barry, Henry Alexander, Esq. *Eversley Lodge, Hants*

Barry, James, Esq. *Castle-street, Oxford-street*

Bartlett, Patrick, Esq.

P Bartolozzi, Francis, Esq. R. A. *North-end*

Barton, Rev. John, Chaplain to the House of Commons

Barwise, Mr. John, *St. Martin's-lane*

Bates, Mr. George Ferne, 73, *Hatton-garden*

Bate, John, Esq. *Bedford-row*

Batson,

Batson, Edward David, Esq. *Lombard-street*
Baverstock, Mr. James, *Alton, Hants*
††Beale, Daniel, Esq. *Fitzroy-square*
P Bean, Mr. Nathaniel, *King's-road, Bedford-row*
P Bean, Mr. Isaac, *ditto*
Bearcroft, Philip, R. Esq. *Vere-street*
††Beard, John, Esq. F. A. S. *Doctors-commons*
Beatson, Robert, Esq. *Kilrick, Scotland*
Beaumont, Daniel, Esq. *Great Russel-street*
Beaumont, John, Esq. *Villiers-street, Strand*
Beazely, Charles, Esq. P. R. I. *Whitehall*
Beddall, Mr. John, *Jekyls, Fenchingfield, Essex*
Belches, Robert, Esq.
Belisario, Mr. John, *Gerard's Cross, Bucks*
Bell, William, Esq. *Norfolk-street, Strand*
Bell, Mr. Anthony, *Charlotte-street, Pimlico*
Belleew, Christopher K. Esq. *Inner Temple*
Bennett, James, Esq. *Bedford-square*
Bennett, Mr. William, *Mitre-court, Cheapside*
Bent, Mr. William, *St. Martin's lane*
Bentham, General Samuel, *Queen's-square, Westminster*
Bentley, Robert, Esq. *Bedford-street, Covent-garden*
††Benwell, Joseph, Esq. *Battersea*
Berkeley, John, Esq. *St. John's-square, Clerkenwell*
Berwick, Joseph, Esq. *Hollow-park, near Worcester*
Bevil, Robert, Esq. 24, *Chancery-lane*
Biddulph, Robert, Esq. M. P. *Arlington-street*
Bignell, William, Esq. *Seething-lane*
Bilsborow, Dewhurst, Esq. *Dalby-hall, Leicestershire*

††Bingley, Thomas, jun. Esq. *Coleman-street*
Bingley, Mr. John, *John-street, Tottenham-court-road*
Birch, Thomas James, Esq. Captain of the 1st Regiment of Life Guards
Birchill, Mr. Matthew, *Fulham*
Birkett, Daniel, Esq. *Trinity-square, Tower-hill*
††Birkhead, Charles, Esq. *Ryegate, Surrey*
Bish, Thomas, Esq. Stock Broker, *Cornhill*
Bishop, Nathaniel, Esq. *Yorkshire*
Bisset, Capt. Robert, Commissary-General, *Great Pulteney-street*
Biven, Edward, Esq. *Lambeth*
Blaauws, William, Esq. *Queen-Ann-street, West*
Black, Mr. George, *Princes-street, Bank*
Blackburne, John, Esq. M. P. F. R. S. *Park-street, Westminster*
††Blades, John, Esq. *Ludgate-hill*
Blair, Alexander, Esq. *Portland-place*
††Blake, William, Esq. *Aldersgate-street*
Blake, Robert, Esq. *Essex-street*
Blandy, John, Esq *Reading*
Blandy, William, Esq. *ditto*
Blane, William, Esq. F. R. S.
Blicke, Charles Tufton, Esq. *Billiter-square*
Blizard, Mr. William, F. R. and A. S.
Blomefield, Colonel, *Shooter's-hill*
Boddington, Thomas, Esq. *Mark-lane*
Boddy, Mr. Francis, *Warwick-lane*
Boddy, John, Esq. *Thames-street*
P Boehm, Edmund, Esq. *Broad-street*

Bonar,

Bonar, Thompson, Esq. *Broad-street-buildiugs*
Booth, John, Esq. *Devonshire-street, Queen-square*
Borradaile, R. Esq. *Fenchurch-street*
Borradaile, William, Esq. *ditto*
Borron, Arthur Esq. *Warrington*
Bostock, the Rev. John, *Windsor*
Bostock, Samuel, Esq. *Borough*
P Bosville, William, Esq. F. R. S. *Gunthwaite Hall, Yorkshire*
Botfield, Thomas, jun. Esq. *Ditton, near Bewdley, Worcestershire*
Bovi, Mr. Mariano, *Piccadilly*
Boulton, Matthew, Esq. F. R. S. *Soho, near Birmingham*
Bousfield, George, Esq. *King's-bench Walk*
††Bowzer, Richard, Esq. 3, *Bedford-row*
††Boydell, John, Esq. and Alderman, *Cheapside*
Bracebridge, Walter, Esq. *Queen-square, Westminster*
Bracken, Rev. Thomas, *Upper John-street, Golden-square*
Braithwaite, Daniel, Esq. F. R. and A. S. *Post-Office, and Grenville-street, Brunswick-square*
Braithwaite, Mr. John, *Brook-street, Tottenham-court-road*
Bramah, Mr. Joseph, *Piccadilly*
Bree, Martin, Esq. *Arundel-street, Strand*
Breton, William, Esq. 52, *Upper Seymour-street, Portman-square*
Brettingham, Robert, Esq. *Grosvenor-place*

Brewer,

Brewer, Mr. John, jun. *Ludgate-hill*
P Brickwood, John, Esq. *Billiter-square*
Brickwood, Mr. Nathaniel, *Thames-street*
Bridge, Mr. Thomas, *Southwark*
Bridgman, William, Esq. P. R. I. and F. L. S. 76, *Old Broad-street.*
††P Broadhead, Theodore Henry, Esq. F. A. S. *Portland-place*
Broadwood, James, Esq. *Charlotte-street, Portland-place*
Brockbank, Mr. Joseph, *Crescent, New Bridge-street, Blackfriars*
Brodie, Alexander, Esq. M. P.
††Brodie, Alexander, Esq. *Carey-street*
Brodie, Mr. John, *Clifford's-inn*
Brogden, James, Esq. M. P. *Park-street*
*P Brooke, Richard Brooke de Capell, Colonel, F.R.S. *Great Oakley, Northamptonshire*
Brounlie, John, M. D. *Carey-street, Lincoln's-inn*
Brown, Thomas, Esq. *Adelphi*
Brown, John, Esq. *John-street, Adelphi*
Browne, Isaac Hawkins, Esq. M.P. F.R.S. *South Audley-street*
Browne, Francis John, Esq. M. P.
Browne, George Howe, Esq. *Bedford-street, Covent-garden*
Browne, Mr. Robert, *Kew*
Browne, Thomas, Esq. 34, *New Bridge-street*
Browning, Charles, Esq. *Horton Lodge, Epsom*
Bryan, Michael, Esq. *Pall-mall*

Bryer,

Bryer, Mr. Robert, 58, *Strand*

Buckle Lewes, Esq. 4, *Upper Seymour-street, Portman-square*

*††Bucknall, Thomas Skip Dyot, Esq. *Baker-street, Portman-square*

Buckell, George, Esq. jun. *Chepstow, Monmouthshire*

Buller, John, Esq. *Morval, Cornwall, and Gloucester-place, Portman-square*

Bunnell, Mr. Joseph, 9, *Southampton-row*

Burdon, Mr. William, *St. Andrew's-court, Holborn*

Burdon, Rowland, Esq. M. P. *Grosvenor-square*

Burgess, John, Esq. *Brook Farm, Hants, or* 107, *Strand*

††Burgoyne, Montague, Esq. *Mark Hall, Harlow, Essex*

Burkitt, Mr. Alexander Sheafe, *Fleet-street*

Burnett, Robert, jun. Esq. *Vauxhall*

P Burney, Charles, M. D. *Greenwich*

Burton, Launcelot, Esq. *Newcastle-street, Strand*

Bury, Edward, Esq. *Walthamstow*

Butler, W. Esq. *Havant, Hants*

Butt, Mr. James Strode, *Paragon, Kent-road*

Butts, John, Esq. *Chatham-square*

Byerley, Mr. Thomas, *York-street, St. James'-square*

††Byfield, George, Esq. *Craven-street*

Byfield, Mr. George, *Craig's-court, Charing-cross*

C.

Carrington, Right Honourable Lord
Clermont, Earl
††Chetwynd, Richard Lord Viscount
Conyngham, Right Honourable William, F. A. S.
Cavendish, Hon. Henry, F. R. and A. S. *Gower-street, Bedford-row*
*††Clifford, the Honourable Robert, V. P. F. A. S. and P. R. I. *Edward-street, Portman-square*
Coghill, Sir John, Bart. *Coghill Hall, Yorkshire*
P Carnegie, Sir David, Bart. M. P.
Caldwell, Ralph, Esq. *Hilborough, Norfolk*
††Caley, John, Esq. F. A. S. *Gray's-inn*
Callender, John, Esq. M. P. *Cumberland-place*
Caldecott, John, Esq. *Rugby, Warwickshire*
Calverley, Thomas, Esq. *Elm-court, Temple*
Campbell, Governor William
Campbell, Duncan, Esq. *Great Queen-street*
Carpenter, Charles, Esq. *Moditonham, Cornwall*
Cartwright, Charles, Esq. *India-house*
Cartwright, Rev. Edmund, *Marybone Park*
Cartwright, Rev. Edmund, jun. *Baliol College, Oxford*
††P Cater, Mr. Richard, *Bread-street, Cheapside*
Chalie, John, Esq. *Bedford-square*
Chamberlayne, John, Esq. *Bromley*
Champernoun, John, Esq. *Totness, Devon*
Champney, Joseph, Esq. *Cheapside*

Chapman, Mr. William, *King-street, Cheapside*
Charington, John, Esq. *Mile-end*
Cheek, J. M. G. Esq. *Evesham, Worcestershire*
Cheek, Mr. Henry, *Manchester*
Cherry, Benjamin, Esq. *Hertford*
Chippendale, Mr. Thomas, *St. Martin's lane*
Christie, Daniel Beat, Esq. *Finedon, near Wellingborough*
†† Christian, John Giles, Esq. *Doctors-commons*
Christian, John, Esq. *Lincoln's-inn*
Claridge, John, Esq. *Upton-on-Severn, Worcestershire*
P Clark, Mr. James
†† Clarke, Richard, Esq. Chamberlain, *Bridge-street, Blackfriars*
Clarke, Mr. Henry, *Gracechurch-street*
Clarke, Richard, Esq. *Worcester*
Clarke, John, Esq. *Edinburgh*
Clarke, William, Esq. *Tynemouth, Northumberland*
Clark, James, Esq. M.D. *Tavistock-street, Covent-garden*
Clark, George, Esq. *Brentford*
Clay, Rev. J. *Dorking, Surrey*
Clay, Henry, Esq. *Birmingham*
†† Cleland, Walter, Esq. *Adelphi Terrace*
Cleveland, William, Esq. *Dowgate-hill*
Close, Rev. Henry John, *Ipswich*
Clough, Dr. *Berners-street*
Clough, Henry Gore, Esq. *of the Light Infantry Guards*
Cockett, Thomas, Esq. *Inner Temple Cloisters*

P Coggan,

P Coggan, Captain John, *East-India House*
Closs, Thomas, Esq. *Bermondsey-street*
Cole, Benjamin, Esq. *Battersea-rise, Surrey*
Cole, Thomas Comyns, Esq. *Woodstock-street, Bond-street*
Coles, William, Esq. *Scot's-yard, Bush-lane*
Coleman, Edward, Esq. Professor at the Veterinary College
†P Colen, Joseph, Esq. *New Inn*
Collier, Mr. Joshua, *Dartmouth-street, Westminster*
††Collins, Thomas, Esq. F. A. S. *Berners-street*
Collins, Benjamin Charles, Esq. *Salisbury*
Collow, William, Esq. *Broad-street-buildings*
Colquhoun, Patrick, Esq.
†Combe, Harvey Christian, Esq. Alderman, M. P. *Great Russell-street, Bloomsbury*
Compton, Mr. Henry, *Charlotte-street, Pimlico*
††Conant, Nathaniel, Esq. *Great Marlborough-street*
P Coningham, James, Esq.
Constable, M. M. Esq. *Evringham, Yorkshire*
Cook, Charles Gomond, Esq. *Southampton-street, Covent-garden*
††Cooke, Mr. John Kenworthy, *Red-lion-square*
Cookney, Charles, Esq. *Staples Inn*
Cooper, Mr. Benjamin, *Earl-street, Blackfriars*
Cooper, Mr. Joseph, 9, *High Holborn*
Coore, John, Esq. *Winchester-street*
Cope, William, Esq. *Sanctuary, Westminster*
Copely, Thomas, Esq. *Netherall, near Doncaster, Yorkshire*

P Coppens, B. M. D. *Ghent, Flanders*
Corbyn, Mr. John, *Holborn*
Cosser, Stephen, Esq. *Abingdon-street*
Cotton, Richard, Esq. *Duke-street, St. James's square*
Courtenay, Thomas Peregrine, Esq. 15, *Lower Grosvenor-sreeet*
† Coussmaker, Lannoy Richard, Esq. *Gower-street, Bedford-square*
Coussmaker, William Kops, Esq. *Brunswick-square*
Cowell, George, Esq. *America-square*
Cowper, William, Esq. *Featherstone-buildings, Holborn*
Cox, Robert Albion, Esq. *Little Britain*
Cox, Mr. William, *Beaufort-buildings*
P Coxe, Peter, Esq. *Surrey Road, Blackfriars*
††Coxwell, Henry, Esq. *Fleet-street*
Cradock, Joseph, Esq. M. A. and F. A. S. *Gumley, Leicestershire*
Craig, Charles Alexander, Esq. *Great Scotland-yard*
Crawford, John, Esq. *Newman-street*
††Crawshay, Richard, Esq. *George-yard, Thames-street*
††Crawshay, William, Esq. *ditto*
Crawley, Samuel, Esq. *Ragnall, Nottinghamshire*
Crichton, John, Esq. *Stephen-street, Rathbone-place*
Crillan, J. F. Esq. *of the Isle of Man*
Crippen, William, Esq. *Reduced Office, Bank*
††Criswell, William, Esq. *Bedford-row*
Crocker, Benjamin, Esq. Surveyor, *Bath*
Crocker, Mr. Abraham, *Froome, Somersetshire*
Crook, Thomas, Esq. *Tytherton, near Chippenham, Wilts*

Crook, John, Esq.
Cross, William, Esq. *Thorngrove House, Worcester*
Crowder, William Henry, Esq. *Frederick's-place, Old Jewry*
††Crowther, Philip Wyatt, Esq. *Guildhall*
Cunningham, William, Esq.
Curwen, John Christian, Esq. M. P.

D.

**Devonshire, William Duke of
P Dartmouth, George Earl of, F. R. and A. S. and F. L. S.
Dundas, Thomas Lord, F. R. and A. S.
P Dolben, Sir William, Bart. V. P. M. P. *at Mr. Marten's, Poet's Corner*
Denham, Sir James Stewart, Bart. M. P.
Durno, Sir James
Douglass, Admiral John, *Chichester*
Dallison, Mr. Thomas, *Wapping*
Dalton, Mr. John, *Bread-street, Cheapside*
†Dampier, Edward, Esq. *Grove-place, Hackney, and Harpur-street*
Dancer, Mr. John, *Doncaster*
††P Daniel, John, Esq. *Mincing-lane*
Davis, Mr. Thomas
Davies, the Rev. J. D. D. F. R. and A. S. Provost, *Eaton*
Davies, Rees, Esq. *Swansea*

Davis, Thomas, Esq. *Mark-lane*
Davison, Rev. Thomas Hartburn, *Northumberland*
Davison, Alexander, Esq. *Swarford, Northumberland, and St. James's square*
Dawes, John, Esq. *Pall-mall*
Dawson, Mr. Robert, *St. Paul's church-yard*
††Day, Thomas, Esq. *Leicester-place, Leicester-fields*
Deane, John, Esq. *Hartley Court, Reading*
††Deane, Matthias, Esq. 4, *Featherstone-buildings, Holborn*
Decort, Henry, Esq. *Hanover-street, Hanover-square*
Delafield, Joseph, Esq. *Castle-street, Long-acre*
Devalaud, George, Esq. *Bloomsbury-place*
De l'Hoste, Lieut. Colonel, *Weymouth-street, Portland-place*
††Dent, Robert, Esq. F. A. S. *Temple-bar*
Dent, John, Esq. M. P. F. A. S. *ditto*
P††Dent, William, Esq. *Battersea-rise*
Desanges, Mr. William, *Wheeler-street, Spitalfields*
Desanges, Mr. John Francis, *ditto*
Devall, Mr. John, *Buckingham-street, Portland-place*
Devenish, Mr. Thomas Courtney, *Villiers-street, Strand*
††Devis, Arthur William, Esq. Member of the Asiatic Society, Bengal, *Gerrard-street*
Dickinson, Henry, Esq. *Leadenhall-street*
P Dickinson, Charles, Esq. *Soho-square*
Dickson, Dr. William, 4, *Clipstone-street, Portland-road*
D'Israeli, Isaac, Esq. *King's-road, Bedford-row*

Ditcher,

Ditcher, Philip, Esq. *East Bergholt, Suffolk*
Dixon, John, Esq. *Phillimore-place, Kensington*
Dodd, Ralph, Esq. *Parliament-street*
Doe, Thomas, Esq. *Bygrave Park, Herts*
Dollond, Mr. Peter, *St. Paul's Church-yard*
Dollond, Mr. John, *ditto*
††Doratt, John, Esq. *Bruton-street*
Douce, Thomas Augustus, Esq. *Townmalling, Kent*
Doughty, John, Esq. *Aldermanbury*
P Douglass, William, Esq. *America-square*
Douglas, John, Esq. *Manchester*
Dowbiggin, Samuel, Esq. *Hatfield Regis, Herts*
Down, Richard, Esq. *Bartholomew-lane*
Downer, Henry, Esq. *Fleet-street*
Drake, Mr. Samuel, *Margaret-street, Westminster*
P Draper, Daniel, Esq. *St. James's street*
Draper, Mr. John, *Clayton-place, Kennington-road*
Driver, Mr. William, *Surrey-square, Kent-road*
Drury, Robert, Esq. *Covent-garden*
Duberley, James, Esq. *Soho-square*
Duckworth, George, Esq. *Manchester*
Dundas, Robert, Esq. M. P. *Somerset-place*
Dundass, David, Esq. *Richmond, Surrey*
Dunn, Samuel, Esq. *Adelphi*
Duppa, Baldwin Duppa, Esq. *Hollingbourn-place, near Maidstone, Kent*
P Dutton, John, Esq. *Catherine-court, Tower-hill*
††*Duval, the Rev. Philip, D. D. F. R. and A. S. *Newman-street*
Dyke, Thomas, Esq. *Doctors-commons*

E.

P Exeter, the Most Noble the Marquis of, F. R. S. and S. A.

††P Egremont, George Wyndham Earl of Eardley, Sampson Lord, M. P. F. R. and A. S.

P Egerton, Rev. Francis Henry, *Bridgewater-house, Pall-mall*

Einsiedel, his Excellency Count

Elphinstone, the Honourable William

Eden, Sir John, Bart. M. P.

Eden, Sir Frederick Morton, Bart. F. A. S.

Erskine, Sir William, Bart. M. P.

†† Eamer, Sir John, *Wood-street, Cheapside*

Erle, Henry, Esq. *Gower-street*

Eaton, Rev. Stephen, A. M. and F. A. S. *St. Ann's, Soho*

P Eaton, Peter, Esq. *Westford, Essex*

Echardt, Francis Fred. Esq. *Whiteland House, Chelsea*

P Eckersall, John, Esq. *Clareton, near Bath*

Eccles, the Rev. Allan Harrison, *Bow, Middlesex*

P Eccleston, Thomas, Esq. *Scaresbrick, Lancashire*

Edwards, John, Esq. *St. Paul's Church-yard*

Edwards, Samuel, Esq. *Stamford, Lincolnshire*

Edwards, Mr. John, *at Mr. Wood's*, No. 35, *Broad-street-buildings*

Edwards, Thomas, Esq. *Coleman-street*

Edwards, Hugh, Esq. 56, *Guildford-street*

Ellice, Alexander, Esq. *Great Pulteney-street, Bath*

Ellill,

Ellill, John, Esq. *Queen-street, Cheapside*
Elliot, John, Esq. *Pimlico*
Elliot, George, Esq. *South-street, Finsbury-square*
Elsley, Gregory, Esq. *Garden-court, Temple*
P Errington, John, Esq. *Stanhope-street, May-fair*
Esdaile, William, Esq. *Clapham*
Eustace, Major Henry, of the Engineers
Evans, Robert, Esq. *Great Surrey-street*
Evans, B. B. Esq. *Cheapside*
*††Ewer, Samuel, Esq. F. L. S. *Hackney*
P Ewbank, Andrew, Esq. *Upper Grosvenor-street*

F.

††Fife, James Earl of, F. R. and A. S.
††Falmouth, George Evelyn Lord Viscount
Finch, Honourable Captain William, *Albury, near Guildford*
P Fludyer, Sir Samuel, Bart. *Fludyer-street, Westminster*
P Fletcher, Sir Henry, Bart. M. P. *Southampton-row, Bloomsbury*
Farquhar, Sir Walter, Bart. *Conduit-street*
Fairman, William, Esq. *Lynsted, Kent*
Farmer, Richard, Esq. *Kennington*
Favenc, Abraham, Esq. *Size-lane*
Featherstone, Mr. William, *Adelphi*
P Felton, Samuel, Esq. F. R. and A. S. *Titchfield-street, Portland-place*
P Fermor, William, Esq.

††Ferris,

††Ferris, Samuel, M. D. F. R. and A. S. *Beaconsfield*
Fidler, James, Esq. *Spa-fields*
Field, William, Esq. *Chatham-place*
Fielding, Jeremiah, Esq. *Bread-street, Cheapside*
Fincham, Francis, Mr. *Charing-cross*
Flamank, John, Esq. *Wallingford*
Fletcher, James, M. D.
Fletcher, John, Esq. 1, *Cecil-street*
Fludyer, George, Esq. M. P. *Fludyer-street*
Fonblanque, John, Esq. M. P. *Lincoln's-inn*
Forbes, David, Esq. 1, *Primrose-street*
Forrest, Digory, Esq. 28, *South Molton-street*
Forde, the Rev. Brownlow, D. D. *St. John's gate*
Forman, William, Esq. *Thames-street*
Forsyth, William, Esq. F. A. S. *Kensington*
Forster, William, Esq. *Hull*
Forster, John, Esq. *Bath*
Fothergill, Mr. John, 85, *Fenchurch-street*
Foulston, Mr. John, 100, *Pall-mall*
Fowler, Dr. William, *Cecil-street, Strand*
††Fowler, David Burton, Esq. *Fig-tree-court, Temple*
Fowler, Christ. Esq. Under-Secretary of the Tax Office
Fox, Mr. John, *Box Hill, Dorking, in Surrey*
P Franco, Jacob, Esq. *St. James's square*
Frankland, William, Esq. *Cavendish-square*
Franklin, Captain William
Franklin, James, Esq. *Dean's-place, Berks*
Fraser, Simon, Esq. *King's-arms-yard, Coleman-street*

Fraser,

Fraser, William, Esq. F. R. S. *Queen-square, Holborn*

Fraser, Mr. David, *Great Pulteney-street*

P Freeman, Stephen, Esq. *Coventry*

Fremantle, William Henry, Esq. *Stanhope-street, May-fair*

French, George, Esq. *Eastcheap*

Frizell, Capt. H. L. of the Prince of Wales's Own Fencibles

Fry, Edmund, Esq. *Type-street, Chiswell-street*

Fry, Mr. Joseph Storrs, *Bristol*

Fullarton, Colonel William, M. P. and F. R. S.

Fuller, Mr. John, *Pentonville*

Fulton, Henry, Esq. *Watling-street*

G.

Gordon, Alexander Duke of, K. T. and F. R. S.

Glasgow, George Earl of, F. R. and A. S.

P Gallaway, Arundell Lord Viscount, M. P. and K. B.

P Greville, Right Hon. Charles, M. P. and F. R. S. *Paddington*

Greville, the Hon. Robert, F. R. and A. S. *Great Cumberland-street*

Grey, Sir Henry, Bart. *Howick, Northumberland*

††Gascoigne, Sir Thomas, Bart. F. A. S. *Partington, in the County of York*

Green, General Sir William, Bart. F. R. and A. S. *Chandos-street, Cavendish-square*

P Geary,

P Geary, Sir William, Bart. M. P. *Oxen Heath, Kent*
Gwillim, Sir Henry, *Madras*
Galloway, James, Esq. *Gower-street*
Garden, Rev. Edmund, *New North-street, Red-lion-square*
Garnet, Robert, Esq. *Cripplegate*
Garthshore, Maxwell, M. D. F. R. and A. S. *St. Martin's lane*
Gee, John, Esq. *Wardour-street, Soho*
Gedge, Mr. William, *Leicester-square*
††Gellibrand, Thomas, Esq. *Bow*
Gent, Col. William, *Guildford-street*
Gibbes, George Smith, M. P. *Bath*
Gibbs, Harry Leeke, Esq. 1, *Clifford-street, New Bond-street*
Gilbert, Mr. Henry, *Holborn*
Giles, Peter, Esq. *Streatham Park, Surrey*
Gillet, Gabriel, Esq. *Guildford-street*
Gisborne, Thomas, M. D. *Clifford-street*
Gist, Samuel, Esq. *Gower-street*
Glanville, Mr. Edward, *Broad Sanctuary, Westminster*
P Godschall, William Man, Esq. F. R. and A. S.
Godwin, James, Esq. *Wingfield, Berks*
P Godwin, Richard, Esq. *Scot's-yard, Bush-lane*
Gold, Mr. John
Goldthwaite, Thomas, jun. Esq.
Goodwyn, Henry, jun. Esq. *East Smithfield*
Gooch, Captain George, *Clapham-road*
Goodhew, William, Esq. *Deptford*
Goodrich, Mr. Simon, *Admiralty, and Upper Eaton-street, Pimlico*

Gorsush,

Gorsush, Thomas Talbot, Esq. *Queen-square, Westminster*
Gotobed, John, Esq. *Norfolk-street*
Gosling, William, Esq. F. A. S. *Fleet-street*
Gosling, Francis, Esq. *Fleet-street*
Gosling, William, Esq. *Clay Hall, Walker, in Herts*
Gowland, Thomas, Esq. *Belmont-place, Vauxhall*
Grace, Mr. William, *Water-street, Chatham-place*
Graham, George, Esq.
Graham, William, Esq. *Thames-street*
Graham, Aaron, Esq. F. R. S. *Great Russell-street*
Graham, Captain Thomas, 17, *New Broad-street*
Grant, General James, *Sackville-street*
Grant, Major John, *Hill-street, Berkeley-square*
††Grant, John, Esq. *Fleet-street*
Grant, Peter, Esq. *Fort Augustus, North Britain*
P††Gray, Walker, Esq. *Water-lane, Tower-street*
Gray, John, Esq. *Somerset-place*
Greathead, Mr. Henry, *South Shields*
P Green, Rupert, Esq. *Percy-street, Rathbone-place*
Green, Mr. William, *Deptford*
††Greene, Thomas, Esq. F. R. and A. S. *Bedford-square*
Greene, Joseph, Esq. *New Basinghall-street*
Green, James, Esq. 38, *Rathbone-place*
Green, Valentine, Esq. Engraver in Mezzotinto to His Majesty, *Fitzroy-place, Fitzroy-square*
Green, Peter, Esq. *Crookham, Berks*
Green, William, Esq. *South Lambeth*
Greenwood, Abraham, Esq. *Staining-lane*
P Gregory, Robert, Esq. *Berners-street*

Grenfell,

Grenfell, William, Esq. *Copper Office, Thames-street*
Grenfell, John, Esq. *Thames-street*
Gresley, Rev. William
Griffin, John, Esq. *Steward-street, Spitalfields*
Griffin, Edward, Esq. *Tufton-street, Westminster*
P††Griffith, Edward, Esq. *of Caernarvon*
Griffith, John, Esq. 16, *Portland-place*
Griffith, Mr. Vaughan, *Paternoster-row*
Groote, George William, Esq. *Dean-street, Soho*
Grosvenor, Richard Erle Drax, Esq. M. P.
P Grote, George, Esq. *Threadneedle-street*
Groves, John, Esq. *Sloane-street, Knightsbridge*
††Grubb, John, Esq. *Lincoln's-inn-fields*
Gruber, Rev. Dr. Michael, *Castle-street, Oxford-market*
Gubbins, Mr. James, *Surrey-street*
Gunnell, Samuel, Esq. of the House of Commons
Guy, John, Esq. *Twickenham*

H.

††*Hardwicke, Philip Earl of, F. R. and A. S.
Hawke, Martin Lord
Heathfield, Francis Augustus Lord
Haslang, his Excellency Count
Harcourt, Honourable General William
Honeywood, Sir John, Bart. M. P.
Hume, Sir Abraham, Bart. F. R. S. *Wormleybury*
Hanmer, Sir Thomas, Bart. *Hanmer, Flintshire*

Heathcote,

Heathcote, Sir John, *Edensor, Langton Hall, Staffordshire*

Herne, Sir William

Harley, Rt. Honourable Thomas, Alderman, M. P. *Aldersgate-street*

Hope, the Right Hon. Brigadier-General John

Hope, the Hon. Lieutenant-Colonel Charles

Hay, Major-General Alexander

Hage, Jens Friedenreick, Esq. his Danish Majesty's Commissioner, *Copenhagen*

Haring, John, Esq. *George-street, Hanover-square*

Hakewell, Henry, Esq. *Margaret-street, Cavendish-square*

Hall, Phineas, Esq.

Hall, James, Esq. *King-street, Holborn*

Hall, Benjamin, Esq. 14, *Upper Gower-street*

Hallet, William, Esq. *Farringdon, Berks*

Hamilton, Rev. Anthony, D. D. F. R. and V. P. of A. S. *Bruton-street*

Hamilton, William, M. D. *Old Broad-street*

P††Hamerton, Charles, Esq. *Whitefriars*

Hammett, John, Esq. *Lombard-street, and New Norfolk-street, Park-lane*

Hammett, James Esdaile, Esq. *Lombard-street*

Hammond, Thomas, Esq. 62, *Park-street, Grosvenor-square*

Handesyde, Charles, Esq. *Newcastle-upon-Tyne*

Hanmer, Job, Esq. *Holbrook Hall, Sudbury*

Hanson, John, Esq. *Bruton-street*

Hanwell, Captain, *Ratcliff-cross*

Hardcastle, Joseph, Esq. *Old Swan-stairs*

Harding,

Harding, John, Esq. *Argyle-street*

P††Harman, Jeremiah, Esq. *Frederick-place, Old Jewry*

Harness, Dr. *Sloane-street, Knightsbridge*

Harper, Robert John, Esq. *British Museum*

Harris, Robert, Esq. Banker, *Reading*

Harrison, Richardson, Esq. *Freern Barnet, Middlesex*

Harrison, Thomas, Esq. *Wolverton, Bucks*

Harrison, Robert, Esq. *Lincoln's-inn-fields*

Harrison, Josiah Robert, Esq. *Cheapside*

Harrop, Joseph, Esq. *Great Marlborough-street*

Harwood, Joseph Joatt, Esq. 16, *Surrey-street*

Harvey, Robert, M. D. F. L. S. P. R. I. *Adelphi*

Haslam, John, Esq. *Bethlem Hospital*

* Hastings, Warren, Esq.

Hawes, Benjamin, Esq.

Hawes, William, M. D. *Spital-square*

Hawkes, George, Esq. *Thames-street*

Hawkins, John, Esq. F. R. S.

Haworth, Richard, Esq. F. A. S. *Chancery-lane*

Hay, Robert, Esq.

Hay, James, Esq.

Heath, Mr. Richard, 8, *Finsbury-square*

††Heaviside, Richard, Esq. *Taunton*

††Heaviside, John, Esq. F. R. S. *George-street, Hanover-square*

P††Hebert, James, Esq. *Great Portland-street*

Hele, John, Esq. *Charlotte-street, Rathbone-place*

††Henderson, John, Esq. LL. B. and F. A. S.

Hendrie,

Hendrie, Patrick, Esq. *Titchborne-street*
Henley, Henry Hoste, Esq. *Sandringham, Norfolk*
Hennell, David, Esq. *Foster-lane*
Henshaw, Benjamin, *Hoddesdon, Hertfordshire*
Hepworth, John, Esq. *York*
Heron, Patrick, Esq. M. P. *Blackheath*
Heriot, John, Esq. *Catherine-street, Strand*
Hewlet, Mr. William, *Strand*
Hewetson, John, Esq. *Tower-hill*
Hewett, William Nathan Wright, Esq. *of Belham House, near Doncaster, Yorkshire*
Hewitt, Mr. Henry Thomas, 3, *Dover-place, Kent-road*
Hicks, Mr. John, *Brighton*
Higgins, Matthew, Esq.
Hilton, John, Esq. *Ironmonger-lane, Cheapside*
Hill, Richard, Esq. *Plymouth, Glamorganshire*
Hill, Edward, Esq. *Albion-street, Blackfriars-road*
††Hinckley, John, Esq. F. A. S. *Inner Temple*
P Hoare, Charles, Esq. F. A. S. 37, *Fleet-street*
Hoare, Jonathan, Esq. *Stoke Newington*
Hobday, William, Esq. *Holles-street, Cavendish-square*
P Hobson, William, Esq.
Hobson, George, Esq.
Hodgson, Mr. George, *Lambeth-marsh*
Hodges, Mr. Richard, *Scotland-yard*
Hogard, Luke, Esq. *Frith-street, Soho*
P Holder, James, Esq. *Ash Park*

P Holland, Henry, Esq. F. A. S. *Sloane-place, Knightsbridge*

Holland, Richard, Esq. *Half-moon-street, Piccadilly*

Holland, Mr. George, *High Holborn*

Hollis, Thomas Brand, Esq. F. R. and A. S. *Chesterfield-street*

Holcombe, Rev. William, *Canon of St. David's*

Holford, John Carteret, Esq. *Richmond*

Holmes, Mr. John, *Whitefriars*

Holme, Mr. William, *Bass-court, Thames-street*

Home, Patrick, Esq. M. P. *Gower-street*

Homfray, Samuel, Esq. *Mirthir Tidville, Glamorganshire*

Honeybourne, Mr. Robert, *Stourbridge*

Honyman, Captain Robert, M. P. *Royal Navy*

Hooper, Thomas, Esq. *Panty Goitre, Monmouthshire*

Horn, Nicholas, Esq. *St. Martin's lane, Cannon-street*

Horner, Thomas, Esq. *Mell's Park, near Froome, Somersetshire*

Horridge, John, Esq. *Raikes, near Bolton*

Horrocks, John, Esq. M. P. *Preston, Lancashire, and Bridge-street*

Horton, Mr. William, *Newgate-street*

Hotham, John, Esq. *Middle Temple-lane*

P Houghton, William, Esq. *Conduit-street*

P Howard, Edward, Esq. F. R. S. *Nottingham-place*

Howard, Bernard, Esq. *Farnham, Suffolk*

† Howell, Richard, Esq. *Thames-street*

Howell,

Howell, Mr. John, *Vine-street, Piccadilly*
Howell, James, Esq. *Somerset-place*
Howell, Edward, Esq. *Lindsey-row, Chelsea*
P Hudson, Vansittart, Esq. *Temple*
Hughes, Rev. Edward, Esq. *Kinmell Park, St. Asaph*
Hughes, Henry, Esq. *King's-road, Bedford-row*
Hulme, William, Esq. *Twydale, Kent*
Hunt, Rowland, Esq.
Hunter, John, Esq. M. P. *Bedford-square*
Hunter, John, Esq. *Clarges-street*
P Hurst, Robert, Esq. M. P. *Horsham Park, Sussex*
Hurt, Charles, Esq. *Wirksworth, Derbyshire*
Hussey, William, Esq. M. P. *Salisbury*
Hyde, John, Esq.

I.

P Ilchester, Henry Thomas Earl of
Johnstone, the Honourable Lieutenant-Colonel Cochrane, M. P.
††Ingilby, Sir John, Bart. M. P. F. R. and A. S.
Johnston, Sir William, Bart. *Glocester-place, New-road*
Inglis, Sir Hugh, Bart. M. P. *Soho-square*
P Jackson, William, Esq. *Dowgate-wharf*
††Jacob, Joseph, Esq. *Greek-street, Soho*
P James, William, Esq. *Wellsbourne, Warwickshire*
Jamison, Mr. *Charing-cross*
P Idle, Christopher, Esq. P. R. I. *Strand*
Jeffery, George, Esq. *Throgmorton-street*

Jefferys, Thomas, Esq. *Cockspur-street*
Jefferys, Mr. George
P Jenkins, Thomas, Esq. *Rome*
P Jenour, Joshua, Esq. *Chigwell-row, Essex*
Jenyns, Rev. George, *Bottisham Hall, Cambridge*
Jervoise, Jervoise Clark, Esq. M. P. *Hanover-square*
Jervoise, Thomas Clarke, Esq. *Vere-street, Cavendish-square*
Jessup, Mr. William, jun. *Farningham, Kent*
Jeudwine, Thomas, Esq. *Basinghall-street*
Ince, William, Esq. *Broad-street, Carnaby-market*
Innes, Hugh, Esq. *Tavistock-street, Bedford-square*
Johnes, Thomas, Esq. M. P. *Hafod, Cardiganshire*
††Johnson, John, Esq. *Mary-le-bone-street*
Johnson, John, jun. Esq. *Berners-street*
Johnson, James, Esq. *Lambeth-walk*
Johnson, Thomas, Esq. *Ely-place*
Johnson, Christopher, Esq. *Queen-square, Bloomsbury*
Johnston, Alexander, Esq. *Drury-lane*
Jones, Edward, Esq. *Wepre Hall, Flintshire*
Jones, John, Esq.
Jones, John, Esq. *Frankley, Wiltshire*
Jones, Mr. Francis, *Grosvenor-street*
Jones, Mr. John, *Charlotte-street, Mansion-house*
† Jones, Griffith, Esq. *Austin-friars*
Jones, Henry, Esq. *Old City Chambers*
Jones, Mr. David, 1, *Barton-street, Westminster*
Jones, Thomas, Esq. *Newcastle-street, Strand*

Jones,

Jones, Thomas, Esq. *Fish-street-hill*
Jones, John, Esq. 11, *Gray's-inn*
Irving, William, Esq. *Great George-street, Westminster*

K.

* Kinnoull, Robert Drummond Hay Earl of
Kinnaird, George Lord, F. R. and A. S.
Keith, George Lord, M. P. *Harley-street*
Kaye, Rev. Sir Richard, Bart. Dean of Lincoln, LL. D. F. R. and A. S.
Kaye, Mr. Joseph, Architect, *Saville-row*
Keighley, James, Esq.
Keith, Capt. F. M. 7, *Terrace, Lower Grosvenor-place*
Kendrick, James, Esq. *Warrington*
Kent, Nathaniel, Esq. *Windsor*
Kenyon, Samuel, Esq. *Lamb's-conduit-street*
†† Keysall, John, Esq. *Charlotte-street, Bedford-square*
Kidman, Mr. John, *Fleet-street*
Kiernan, Mr. Thomas, *Blackfriars-road*
King, the Rev. Richard, *Worthin, Shropshire*
King, Mr. Thomas, jun.
King, Mr. Joseph, 8, *King's-bench-walk, Temple*
Kingston, John, Esq. *Stratford-place*
Kirkby, William, Esq. *Exchequer Office, Temple*
Kitchener, William, Esq. *Buckingham-street, Strand*
Knill, John, Esq. *Gray's-inn*
Knight, Mr. George, *Cliffe, near Rochester*

Knight, Mr. Joseph, 427, *Strand*
Knowles, James M. Esq. *Lombard-street*
Knubley, Richard, Esq. *Bath*

L.

P Lansdowne, the Most Noble the Marquis of
* Leicester, George Earl of, F. R. S. and President of the Society of Antiquaries
**Liverpool, Charles Earl of, V. P.
P Leicester, Sir John, Bart. M. P. *Piccadilly*
P Laurent, Sir Francis, Kt.
P Lewes, Sir Watkin, Kt. V. P. *Parliament-street*
P††Lambert, Charles, Esq. F. A. S. *Temple*
Lambert, Anthony, Esq.
Landmann, Isaac, Esq. *Royal Academy, Woolwich*
Langton, Mr. Daniel, Builder, *Wandsworth*
P Larkins, William, Esq. F. R. and A. S. *Blackheath-point*
Law, Thomas, Esq. *Abroad*
Lawrence, Richard, Esq. *Mincing lane*
Lawrence, Richard James, Esq.
Leach, Mr. Edward, *Cotton Manufactory, Tottenham-court-road*
Leader, William, Esq. *Wandsworth*
P Leader, Henry, Esq. *Great St. Helen's*
Lefevre, Charles Shaw, Esq. M. P. 4, *Spring-gardens*
††Leake, William, Esq. *Sackville-street*
Leatham, Isaac, Esq. *Burton-le-street, Yorkshire*

Lechmer,

Lechmer, William, Esq. Captain in the Royal Navy, *Steeple Aston, Oxfordshire*

Lees, William, Esq. *Office of Ordnance, Tower*

Legh, George John, Esq. *High Legh, Cheshire*

††Legh, John, Esq. *Bedford-square*

Lenox, Colonel Alexander, *Charlotte-street, Portland-place*

Lester, Mr. William, *Northampton*

Lettsom, John Coakley, M. D. F. R. and A. S. *Basinghall-street*

P Levien, Solomon, Esq. 73, *Aldersgate-street*

Levy, Moses Isaac, Esq. F. A. S. *George-street, Hanover-square*

††Lewis, Percival, Esq. *Lincoln's-inn*

††Lewis, William, Esq. F. L. S. *Holborn*

Lewis, Thomas, Esq. *Great James-street, Bedford-row*

Leys, Thomas, Esq.

Lillingstone, A. Spoone, Esq.

Linstow, Wilhelm Bernhard, Esq. *of Copenhagen*

Liptrap, John, Esq. F. A. and L. S. *Whitechapel-road*

Little, Mr. James, *Mortimer-street, Cavendish-square*

Llewellyn, John, Esq. *Penllergare, Glamorganshire*

Loat, Mr. Richard, *Long-acre*

Llewellin, Daniel, Esq. *Cowley-street, Westminster*

P. Lloyd, William, Esq.

Lloyd, Thomas, Esq. *Buckingham-street, Strand*

Loyd, Lewis, Esq. *Lothbury*

* Lock, William, Esq.

Lockett, George, Esq. *Southampton-place*

P Long, Samuel, Esq. M. P. *Hill-street, Berkeley-square*

Lovat, Samuel, Esq. *Loughton, Essex*

P Loveden, Edward Loveden, Esq. M. P. *Busket-Park*

Lowry, Mr. Wilson, *Titchfield-street*

Lowry, Mrs. Rebeckah, *ditto*

Lowten, Thomas, Esq. *Temple*

Lowth, Rev. Robert, *George-street, Hanover-square*

Loxdale, Thomas, Esq. *Braidley Lodge, near Bilson, Staffordshire*

††Lumley, William, Esq. *Lincoln's-inn-fields*

† Lynd, James, Esq. *Beaufort-buildings*

M.

* Macclesfield, George Earl of

* Morton, George Earl of, F. R. and A. S.

P Mount Norris, Earl of, *Stratford-place*

P Malmesbury, James Earl of, K. B. and LL. D.

Milford, Richard Lord, M. P.

**Marsham, the Honourable Lord Viscount

*PMonckton, the Honourable Edward, M. P. *Portland-place*

Middleton, Sir Charles, Bart. M. P. *Hertford-street, May-fair*

Mac Pherson, Sir John, Bart. M. P. *Brompton*

Morshead, Sir John, Bart. *Hampton Court*

Monro,

Monro, Sir Hugh, Bart. *Gloucester-place, Portman-square*

P Mackreth, Sir Robert, M. P. *Cork-street*

Mac Cauley, Mr. Alexander, *Islington*

Macdonald, John, M. D.

M'Leod, John, Esq.

††Mac George, William, Esq. *New Bond-street*

Mackenzie, Alexander, Esq. 38, *Norfolk-street*

Macklin, John, Esq. 139, *Cheapside*

Macmurdo, Mr. Edward Longdon, *Bread-street*

P Macnamara, John, Esq. *Baker-street, Portman-square*

Mac Dougal, Mr. James, 418, *Oxford-street*

Mac Konochie, A. Lochart, Esq.

Magens, Dorrien, Esq. *Cavendish-square*

Maitland, Ebenezer, Esq. *Coleman-street*

Major, the Honourable John Henniker, M. P. F. R. S. and S. A. *Portman-square*

Malcolm, Mr. Jacob, *Stockwell*

Malton, James, Esq. *Norton-street, Portland-place*

Manley, John George, Esq. *Braziers, Oxon*

Mainwaring, Mr. Thomas, *Strand*

March, Mr. William, *Ludgate-hill*

Marks, Mr. John, Builder, *Princes-street, Hanover-square*

Marriott, John Martin, Esq. *Lamb's-conduit-street*

Marsland, Samuel, Esq. *Manchester*

Marsh, Mr. William, *South-street, Grosvenor-square*

Marshall, Andrew, M. D. *Bartlett's-buildings*

Marter, William, Esq. *Kensington*

Martin,

Martin, James, Esq. M. P. *Downing-street*
Martin, Matthew, Esq. *Parliament-street*
Martin, James, Esq. 1, *Essex-court, Temple*
Martyn, the Reverend Thomas, B. D. F. R. S. F. L. S. *Professor of Botany, Cambridge*
Martin, Thomas, Esq.
††Maskall, Samuel, Esq. *Mitre-court, Milk-street*
Mason, John, Esq. *Cannon-street*
Masquerier, John James, Esq. 42, *Greek-street, Soho*
Matthews, Edward, Esq. *Sol's-row, Tottenham-court-road*
Maud, John, Esq. *Aldersgate-street*
Mawley, Edward, Esq. *Thornhaugh-street*
Mayhew, John, Esq. *Broad-street, Carnaby-market*
Mayhew, James, Esq. 35, *Great Pulteney-street*
† Mayniac, Francis, Esq. *St. John's square*
Meheux, John, Esq. *Hans Place, Sloane-street*
* Melville, General Robert, F. R. and A. S. *Brewer-street*
††Meredith, William, Esq. *Harley-place*
††Meredith, George, Esq. F. A. S. P. R. I. *Nottingham-place*
Merry, William, Esq, *Gower-street*
Mestaer, Peter Everett, Esq. *New Broad-street*
Metcalfe, Christopher Barton, Esq. *West Ham*
Meux, Richard, jun. Esq. *Liquor-pond-street*
Mellish, Samuel, Esq. *Gray's-inn*
Mellish, Thomas, Esq. *Kent-street, Borough*
††Meyrick, John, Esq. F. A. S. *Great George-street*

Meyrick,

Meyrick, Owen Patland, Esq. *Bodalgan, Anglesey*
Michele, Henry, Esq. *George-street, Adelphi*
†††Mitchell, Matthew, Esq. *Beaufort-buildings, Strand*
††Middleton, John, Esq. *Lambeth*
Medford, Rev. William, *Hurst, Berks*
Midgley, Mr. George Deakin, Chemist, *Strand*
P Midford, George, M. D. *Reading*
††Mildred, Daniel, Esq. *White-hart-court, Grace-church-street*
Miles, Mr. John, *Birmingham*
Millikin, Halley Benson, Esq. *Norfolk-street, Strand*
Millington, Langford, Esq. *Tooting, and Berners-street*
Millington, Mr. Thomas, *Golden-square*
P Mills, Abraham, Esq. *Fence House, Macclesfield*
Mills, Mr. George, *Old Swan-stairs*
Mills, Samuel, Esq. *Finsbury-place*
Milles, Thomas, Esq. 4, *New-square, Lincoln's-inn*
Miller, John, Esq. *Red-lion-square*
Miller, Mr. Samuel, 23, *Cleveland-street, Fitz-roy-square*
Milnes, Richard Slater, Esq. M. P. *Foiston, near Ferrybridge, Yorkshire*
Minchin, Thomas A. Esq. *Gosport*
Minier, Mr. William, *Strand*
Minier, Mr. Charles, *ditto*
Minish, Mr. William, *Whitechapel*
Minnitt, William, Esq. *Milbank, Westminster*
Mist, Mr. Henry, *Long-acre*

Mitchel,

Mitchel, Michael, Esq. *Walthamstow*
Mitchel, William, Esq. M. P.
Mitchell, Robert, Esq. *Newman-street*
Mitford, Robert, Esq. *Great Portland-street*
Montresor, John, Esq.
P Moore, Daniel, Esq. *Lincoln's-inn*
Morley, William, Esq. *New Broad-street*
Morse, Leonard, Esq. F. R. S. and A. S. *Great George-street, Westminster*
Morris, Mr. William, *Whitcombe-street*
Mortimer, Charles, Esq. *Greenhammerton, Yorkshire, and* 42, *Upper Grosvenor-street*
Morton, Thomas, Esq. *John-street, Adelphi*
††Moser, Mr. John, *Frith-street, Soho*
Munn, Daniel Rolfe, Esq. *Hammersmith*
Munnings, J. S. Esq. *Gray's-inn-square*
Murphy, John Barnwell, Esq.
Murrey, John, M. D. *Bury-street, St. James's*
Myers, Mr. William, *Aldersgate-street*
Myers, Thomas, Esq. *Park-place*

N.

P Norfolk, Charles Duke of, President, F. R. and A. S.
**Northumberland, Hugh Duke of, V. P. K. G. F. R. and A. S.
††Northampton, Charles Earl of
Northesk, William Earl of
Nepean, Sir Evan, Bart. M. P. Secretary to the Admiralty

Nash,

Nash, Mr. Thomas, *Worcester*
Nash, John, Esq. *Dover-street*
Neill, Philip, Esq. *Temple*
Nethersole, William, Esq. *Essex-street, Strand*
Newbury, Jacob, Esq. *New Inn*
Newcombe, William, Esq. *Bank, and* 23, *Threadneedle-street*
† Newman, John, Esq. 80, *New Broad-street*
P Newton, Robert, Esq. *Norton-house, Berks*
P Newton, Andrew, Esq.
Newton, William Morris, Esq. *Wallington, Surrey*
Newton, Mr. John, *Lamb's-conduit-street*
De Neyva, Joseph da Cunha Para, Esq. *Artillery-place*
††Nichols, John, Esq. *Red-lion-passage, Fleet-street*
Nicholson, William, Esq. *Bartholomew Hospital*
Nichollson, Samuel, Esq. *Cateaton-street*
††Nicol, George, Esq. *Pall-mall*
Nixon, Rev. Robert, F. S. A. F. R. S. *Vale Mascal, Northbray, Kent,*
Noble, William, Esq. *Pall-mall*
Nollekens, Joseph, Esq. R. A. *Mortimer-street*
Nouaille, Peter, Esq. *Greatness, Kent*
Norman, Robert, Esq. *Cannon-street*
Northey, William, Esq. *Queen-street, May-fair*
Norton, Mr. John, *Tooley-street*
Nutting, Mr. Joseph, *King-street, Covent-garden*

O.

P Ossory, John Earl of Upper, F. R. and A. S.
Ogilvie, Dr. *Doctors-commons*
Ogle, Mr. Thomas, *Abroad*
Oldham, John, Esq. *Grafton-street*
Oliver, the Rev. John, *Croombs-hill, Greenwich*
Ord, John, Esq. F. R. and A. S. *Lincoln's-inn-fields*
Orrell, Thomas, Esq. *Winsley-street, Oxford-street*
Osorio, Abraham, Esq. *Theobald's-road*
Ovey, Richard, Esq. *Tavistock-street*

P.

**Portland, William Henry Duke of, V. P. K. G. F. R. and A. S.
**Pitt, the Right Honourable William, M. P.
Pelham, the Right Honourable Thomas, M. P. *Stratton-street*
† Peel, Sir Robert, Bart. M. P. *Bury, Lancashire*
* Pusey, Honourable Philip, *Grosvenor-square*
Pulteney, Sir William, Bart. M. P. *Bath-house*
Paul, Sir George Onesiphorus, Bart. *Lower Grosvenor-street*
Prescott, Sir George, Bart. *Cheshunt*
Packer, Mr. William, *Charlotte-street, Bloomsbury*
Page, Francis, Esq. M. P. *Atsbon, Oxfordshire*
Page, Francis, Esq. *Newbury, Berks*
Page, Frederick, Esq. *ditto*

††Page, Mr. John, *High Holborn*
P Paice, Mr. Joseph, *Bread-street-hill*
Pakenham, Captain Edward, R. N.
Palmer, John Abearn, Esq. *Uppingham, Rutlandshire*
Papworth, Mr. Thomas, 60, *Newman-street*
Parke, John, Esq. *Manchester*
††Parkes, Richard, Esq. *Broad-street, Bloomsbury*
Parker, David, Esq. *King's-mews*
Parker, Mr. William, *Fleet-street*
††Parker, Mr. Samuel, *Bridge-street, Blackfriars*
Parker, Mr. Thomas, *Fleet-street*
Parker, Samuel Walker, Esq. *White Lead Works, Newcastle-upon-Tyne*
Parkinson, Mr. Thomas, *Bury-place, Bloomsbury*
Parnell, Mr. Hugh, *Church-street, Spitalfields*
Parry, William, Esq. *Norton Hall, Wiltshire*
† Parson, S. P. LL. D. *Doctors-commons*
Paterson, William, Esq. *Devonshire-place*
Paxton, Mr. Christopher, *Aldersgate-street*
Patience, Mr. Joseph, *Wormwood-street, Bishopsgate-street*
Payn, James, Esq. *Maidenhead, Berks*
††Payne, Samuel, Esq. *Vauxhall*
Peachey, Col. M. P.
Peacock, Mr. Lewis, *Lincoln's-inn-fields*
Peale, Rembrandt, Esq. 12, *Fludyer-street, Westminster*
Pearce, William, Esq. *Craig's-court*
Pearsall, Mr. James, *Cheapside*
††Pearson, James, Esq. *Basinghall-street*

Peel,

Peel, Jonathan, Esq. *Lawrence-lane, Cheapside*
Peel, Joseph, Esq. *ditto*
Peirson, Peter, Esq. F. R. and A. S. *Inner Temple*
Pelerin, Henry Ferdinand, Esq. 12, *New North-street, Red-lion-street*
Pemberton, John, Esq. *Inner Temple*
Penruddock, Charles, Esq.
Penton, Mr. George, *New-street-square, Shoe-lane*
Pepys, W. H. jun. Esq. *Poultry*
P Perin, William Philip, Esq. F. R. and A. S.
Perrott, George, Esq. *Craycombe-house, Worcestershire*
Perry, John, Esq. *Blackwall*
Perry, James, Esq. *Strand*
Petrie, William, Esq. M. P. F. R. and A. S. *Hertford-street, May-fair*
Petrie, John, Esq. M. P. *Portland-place*
P Pettiward, Roger, Esq. *Baker-street, Portman square*
Phillips, John, Esq. *Ely*
Phillips, John, Esq. 13, *Southampton-street, Bloomsbury*
Phillips, Mr. Samuel, *St. George's-road, Blackfriars-bridge*
Phillips, Mr. Richard, *St. Paul's Church-yard*
Phillips, William, Esq. *Shinfield Park, Berks*
Phillips, Rev. William, *Mortimer, Berks*
Phillipson, Thomas, Esq. *Harpur-street*
Phipps, Jonathan W. Esq. *Pancras-lane*
Phipps, John Wathen, Esq. *Cork-street*
Pierrie, William, Esq. *Devonshire-street, Queen-square*
Pinney, Azariah, Esq. *Bride-court, Bridge-street*
Piper, Mr. Stephen, *Haverhill, Essex*

Pitman,

Pitman, Ambrose, Esq. *Green-street, Grosvenor-square*

Pitt, William Morton, Esq. M. P. and F. R. S. *Arlington-street*

P††Pitt, Thomas, Esq. V. P. F. A. S. *Wimpole-street*

Pix, George Banastre, Esq. *Alfred-place, Blackfriars-road*

Planta, Joseph, Esq. F. R. S. *British Museum*

Pocock, Charles, Esq. *Sowley, in the County of Southampton*

Pollen, George Augustus, Esq. *Hill House, Leatherhead*

Pollett, Mr. Robert, *North Weald, near Epping*

P Portman, Edward Berkeley, Esq. *Bryanston, near Blandford, Dorset*

Porter, William, Esq. *Copthall-court, Throgmorton-street*

Pote, Edward Ephraim, Esq. *East-Indies*

P Potter, Christopher, Esq. *Abroad*

Potter, George, Esq. *Charing-cross*

Powell, David, jun. Esq. *Little St. Helen's*

Powell, John Clark, Esq. *ditto*

††Powell, Arthur Annesly, Esq. *Devonshire-place*

†Powell, Richard, M. D. *Essex-street*

Powlett, William Powlett, Esq. *Sambourne, near Stockbridge*

Poynder, Thomas, jun. Esq. *Bishopsgate-street*

P Prado, Samuel, Esq. *Grafton-street*

Praed, William, Esq. M. P. *Tyringham, Bucks*

Pratt, Edward Roger, Esq. *Ryston House, Norfolk*

Pratt, John, Esq. *Lower Brook-street*
Preston, Mr. Thomas, *Strand*
Preston, Richard, Esq. *Temple*
Pricket, Thomas, Esq. *Wanstead, Essex*
Pringle, Mark, Esq.
Prinsep, John, Esq.
Pryce, Benjamin, Esq. *Bath*
Pugh, David Heron, Esq.
Purser, Mr. William, *Bennett-street, Blackfriars-road*

Q.

* Queensberry, William Duke of, K. T.

R.

**Richmond, Charles Duke of, V. P. K. G. F. R. and A. S.
**Radnor, Jacob Earl of, V. P. F. R. and A. S.
Rosslyn, Earl of, *Russel-square*
**Romney, Charles Earl of, V. P. and F. R. S.
* Ryder, the Right Honourable Dudley, M. P.
P Rawlins, Sir William
††Ridley, Sir Matthew White, Bart. M. P. *Portland-place*
††Raby, Alexander, Esq. *Broad Sauctuary*
Radcliffe, John, Esq. No. 2, *New-inn*
Rae, John, Esq. *Broad-street-buildings*
Raggett, Richard, Esq. *Odiham, Southampton*
Raikes, Thomas, Esq. *New Broad-street*

P Ramey,

P Ramey, John, Esq. *Ormesby, Norfolk*
††Ramsbottom, John, Esq. *Aldersgate-street*
††Ramsbottom, Richard, Esq. *ditto*
Randell, William, Esq. *Belmont-cottage, Vauxhall*
Rastrick, Mr. John, *Morpeth*
Rawlinson, Abraham, Esq. *Lancaster*
Rawlinson, Thomas, Esq. *ditto*
Reaston, Francis Bushell, Esq. *Queen Anne-street West*
Read, General Henry, *Ramsbury, Wiltshire*
Reeves, John, Esq. F. R. and A. S. *Cecil-street, Strand*
Reeves, Mr. William John, *Holborn-bridge*
Reeve, Joshua, Esq. *Dean-street, Canterbury-square*
Reeve, Mr. Richard, *Titchborne-street, Portland-place*
Reeve, Mr. Gilson, *Crutched-friars*
Reid, Mr. John, *Fan-street, Aldersgate-street*
††Reid, Andrew, Esq. *Cleveland-row, St. James's*
††Reid, John, Esq. *Bedford-square*
Reina, Mr. Peter Anthony, *Great Newport-street*
††Remington, John, Esq. *Milk-street, Cheapside, and Clapton*
Reynolds, Major Thomas Vincent
Ricard, the Rev. Francis, *Jersey*
Richardson, Mr. Charles, *Piazza, Covent-garden*
Riddell, Colonel John
P Ring, Thomas, Esq. *Reading, Berks*
Rivier, Philip, Esq. *Lawrence-Poultney-lane*
Roberts, Colonel Roger Elliott, 46, *Albemarle-street*
Roberts, Robert, Esq. *Paragon, Southwark*

P Roberts, Thomas, Esq. *Charter-house-square*
Roberts, Rev. William Hancock, D. D. *Loughborough House*
Robertson, William, M. D. *Golden-square*
Robertson, James, M. D. F. R. S. *Ibbetson's Hotel*
Robinson, Samuel Wakefield, Esq.
††Robinson, George, Esq.
P Robinson, Thomas, Esq. *Bentinck-street, Manchester-square*
Robinson, Mr. John, *Arundel-street, Strand*
Robinson, George, Esq. *Winchester-street*
Robinson, John, Esq. M. P. *Wyke House, Isleworth*
Robins, Mr. John, *Warwick-street*
Robley, John, Esq. *Aldersgate-street*
††Robson, James, Esq. High Bailiff of the City of Westminster, *Conduit-street*
Rodes, Cornelius Heathcote, Esq. *Balborough, Derbyshire*
Rogers, Samuel, Esq. F. R. S. *Paper-buildings, Temple*
Rogers, Edward, Esq. 10, *Harcourt-buildings, Temple*
Rondeau, James, Esq. 3, *Shorter's-court, Throgmorton-street*
Roope, John, Esq. *Yarmouth*
Roper, Rev. Francis, *Wexham Parsonage, near Slough, Berks*
Roper, Mr. Robert, *Houndsditch*
Rose, George, Esq. M. P. *Old Palace-yard*

Rose, George Henry, Esq. *St. James's square*
Rose, John, Esq. *Gray's-inn-square*
P Ross, General Patrick, F. R. and A. S. *Harley-street*
Rough, William, Esq. *Inner Temple*
Rowcroft, Thomas, Alderman, P. R. I. *Lawrence Poultney-lane*
Rowe, John, Esq. *Salisbury-court, Fleet-street*
Rowley, Owsley, Esq. *Hants*
Rowntree, Mr. Thomas, *Great Surrey-street, Black-friars-road*
Rucker, Daniel Henry, Esq. *Broad-street, City*
Ruggles, Thomas, Esq. F. A. and L. S. *Clare, Suffolk*
Runquest, Peter Andrew, Esq. *Bury-court, St. Mary Axe*
Rush, John, Esq. *Sackville-street*
P Russel, Jesse, Esq. *Goodman's-fields*
Russel, William, Esq. *Berwick, Northumberland*

S.

* Shrewsbury, Charles Earl of
P Suffolk, John Earl of
P Shaftesbury, Anthony Earl of, F. R. and A. S.
Scarborough, George Augustus Earl of
P Stanhope, Charles Earl of, F. R. S.
P St. Vincent, John Earl of
P Scarsdale, Nathaniel Lord

Stuart, the Honourable Charles, M. P.
St. Aubyn, Sir John, Bart. F. R. and A. S. *Stratford-place*
Sheffield, Sir John, Bart. *Portland-place*
Smith, Sir John, Bart. F. R. and A. S. *Sydling, Dorsetshire*
††Sinclair, Sir John, Bart. M. P. F. R. and A. S.
Stephens, Sir Philip, Bart. M. P. F. R. and A. S.
††Smith, Sir William Sidney, K. S. M. P. R. N. *Cave, near Dover, Kent*
Stirling, Sir Walter, Bart. *Pall-mall*
Smith, General Edward, *Walmer House, Kent*
St. Barbe, John, Esq. *Seething-lane*
P††Salte, William, Esq. *Poultry*
Samuel, Mr. George, *Richmond-buildings, Soho*
Sanders, John, Esq. *Mortlake, Surrey*
Sandford, Rev. Thomas, *Isle of Man*
Sansom, Philip, Esq. *Fenchurch-street*
Sargeaunt, Mr. John, *Great Queen-street*
Sarel, Andrew Lovering, Esq. *Surrey-street*
Satterthwaite, Mr. John, *Mincing-lane*
Savage, Mr. James, *Great Queen-street*
Saunders, Thomas, Esq. *Haydon-square, Minories*
Saunders, George, Esq. F. A. S. *Oxford-street*
P Saunders, Edward Grey, Esq. *Harley-place*
Saxon, Mr. Samuel, *Parliament-street*
Sayer, Henry J. Esq. *Lincoln's-inn*
Scarbrow, Stephen, Esq. *Conway-street, Fitzroy-square*
Schaw, Lieutenant-Colonel John B.

Scholey,

Scholey, Mr. George, *Old Swan-stairs*
P Scott, David, Esq. *Devonshire-place*
P Scott, John, Esq. *Adelphi Terrace*
Scott, Robert, Esq. *Grosvenor-square*
Scott, Hugh, Esq.
Scott, John, Esq. *Tuffnel-place, Islington*
††Seale, Mr. David, *Peckham*
Seddon, Mr. Thomas, *Aldersgate-street*
P Selby, Henry Collingwood, Esq. 2, *Gray's-inn-square*
Serra, Isaac, Esq. *King's-road, Bedford-row*
Sewell, the Reverend George, *Byfleet, near Ripley, Surrey*
Sewell, Mr. George, *London-street, Fitzroy-square*
Shadwell, Henry, Esq. *Beverley, Yorkshire*
Shaw, John, Esq. *Great James-street, Bedford-row*
Sharp, Hercules, Esq. *Chester-place, Kennington*
Sharp, Cuthbert, Esq. *ditto*
††Sheldon, Thomas, Esq. F. R. S. *Tottenham-court-road*
Sheldrake, Mr. Timothy, *Strand*
††Sheplee, Richard, Esq. *Horslydown*
Sherwood, William, Esq. *Mark-lane*
Shiffner, Godin, Esq. *Weymouth-street, Portland-place*
P Shipley, Mr. William, Gent. *Maidstone, Kent*
P Shore, Samuel, Esq. *Norton-hall, Derbyshire*
P Shore, Samuel, jun. Esq.
Sibley, Joseph, Esq. *Market-street, Herts*

Sidney, John, Esq. *Court Lodge, Yalding, Kent*
Simeon, Edward, Esq. *of Salvadore-house*
Simonds, William B. Esq. *Reading*
Simpson, Mr. Thomas, *Chelsea Water-works*
Simpken, Mr. Charles, *Oxford-street*
Simpkin, Mr. Thomas, *Strand*
Skinner, Thomas, Esq. Alderman, *Aldersgate-street*
Skinner, William, Esq. *Finsbury-square*
Slack, Thomas Cartwright, Esq. *Bloomsbury-square*
Slade, John, Esq.
Slade, John Moore, Esq. *Chatham*
Smallwood, William, Esq. *Jerusalem Coffee-house*
Smart, Mr. George, *Camden Town*
Smirnove, Rev. James, *Upper Mary-le-bone-street*
* Smith, George, Esq.
P††Smith, John Spencer, Esq. M. P. *Dover, Kent*
††Smith, William, Esq. *Lombard-street*
Smith, William, Esq. M. P. *Park-street*
††Smith, Joshua, Esq. M. P. *Great George-street, Westminster*
Smith, Mr. Dedrick, *Gerard-street*
* Smith, Mr. Nathan, *Knightsbridge, Brighthelmstone*
Smith, Captain William, of the Royal Navy
Smith, Henry, Esq. *Drapers-hall*
Smith, Mr. Richard, *Crown-court, Cheapside*
Smith, Mr. Edward, *Broad-street, City*
††Smith, George, Esq. *Lombard-street*
Smith, Eaglesfield, Esq.
Smith, John Prince, Esq. *Serjeants-inn*

Smith,

Smith, Robert, Esq. F. R. S, and F. A. S. *Basing-hall-street*

Smith, Walthall Ridgway, Esq. 5, *New Inn*

Smith, Mr. Thomas, *Strand*

Soane, John, Esq. F. A. S. P. R. I. *Lincoln's-inn-fields*

Songa, Anthony, Esq.

Sowerby, John, Esq. *Watling-street*

††Sparks, Robert, Esq. *St. John's street*

††Sparks, Thomas, Esq. *Aldersgate-street*

Sparkes, Joseph, Esq. *Red-lion-square*

Sparkes, John, Esq. *Doughty-street*

Sparrow, Robert, Esq. *Portland-place, and Workingham-hall, Suffolk*

Spiller, James, Esq. *Guildford-street*

Spilsbury, Mr. William, *Snowhill*

Spilsbury, Mr. Charles, *ditto*

Splitgerber, Mr. John Christian, *Church-court, Walbrook*

Splitgerber, Mr. Frederick, *ditto*

Spottiswood, John, Esq. *Sackville-street*

P Spurrier, Mr. Isaac, *Greek-street, Soho*

Stackhouse, Thomas, Esq. *Featherstone-buildings, Holborn*

Stafford, Robert, Esq. Banker, *Huntingdon*

Standen, the Reverend J. H. Rector of Murston, *Kent*

Standish, Edward Townley, Esq. *Park-street, Westminster, and of Standish-hall, in Lancashire*

Stanhope, Walter Spencer, Esq. *Upper Grosvenor-street*

Stanley,

Stanley, George, Esq. *Ponsonby-hall, Cumberland*
Stapleton, Mr. William, 1, *Water-lane, Whitefriars*
Steell, Robert, Esq. *Finsbury-square*
Steer, Charles, Esq. *Church-street, Spital-fields*
P††Steers, John William, Esq. F. A. S. 7, *Fig-tree-court, Inner Temple*
P Steers, James, Esq. *ditto*
*††Stephens, Francis, Esq. F. R. and A. S. Commissioner of the Victualling Office
Stephens, James, Esq. *Camerlton-house, near Bath*
Stephens, John, Esq. *Reading*
Stevenson, Thomas, M. D.
Stevenson, James, M. D.
Stiff, Mr. Thomas, *New-street, Covent-garden*
Stirling, William, Esq. *Bread-street, Cheapside*
Still, Mr. Samuel Stanford, *Bankside, Southwark*
Stockwell, John, Esq. *Crutched-friars*
Stockdale, Mr. Jeremiah, *Holborn*
Stodart, William, Esq. *Golden-square*
Stone, Mr. Thomas
††Stone, William, Esq.
Stonard, Nathaniel, Esq. *Bow, Middlesex*
Storey, Robert, Esq. *Bedford-square*
Strachan, James, Esq. *Mincing-lane*
††Strange, James, Esq. M. P. *Bond-street*
Stratton, Mr. William, *Gutter-lane*
Street, Mr. James Wallis, *King-street, Bloomsbury*
Street, John, Esq. *Brunswick-square*
Stretton, William, Esq. *Broad-street, Soho*
Stutely, Mr. Joseph, jun. *Northumberland-street*

Suart,

Suart, George, Esq. *Lancaster*

P Sulivan, Richard Joseph, Esq. M. P. F. R. and A. S. *Grafton-street*

Sulivan, John, Esq. M. P. *Chesterfield-street, May-fair*

Sumner, George, Esq. *George-street, Westminster*

††P Sutton, Robert, Esq. *Finsbury-square*

Swaine, Edward, Esq. *Highbury Terrace*

Sykes, Mark Masterman, Esq. *Sledmere, Yorkshire*

Sykes, Richard, Esq. 3, *Walbrook*

Symmons, John, Esq. F. R. A. S. and L. S. *Paddington-house*

T.

**Thanet, Sackville Earl of

Tabrum, Mr. Robert, *Gracechurch-street*

Tait, William, Esq. *Cardiff*

P Talbot, Thomas Mansel, Esq. *Penrie Castle, Glamorganshire*

Tapster, Mr. Richard, *Barnet, Herts*

††Tate, William, Esq. *Queen-street, Chelsea*

Tatham, Colonel William, *Staple's-inn-buildings*

Taubman, Major John, *Isle of Man*

Taylor, William, Esq. M. P. 32, *Pall-mall*

Taylor, William, Esq. *Charlotte-street, Bedford-square*

Taylor, John, Esq. *John-street, Adelphi*

Taylor,

Taylor, Mr. Josiah, *Holborn*
Taylor, Major Charles, *of 7th Light Dragoons*
Taylor, Thomas, Esq. *Friday-street, Cheapside*
P Teixiera, Abraham David, Esq. *Mincing-lane*
Tekell, John, Esq. *Lamb's-buildings, Temple*
Templer, James, Esq. *Stover-lodge, Devon*
Tennant, George, Esq. 21, *Southampton-row, Bloomsbury*
Test, Potter, Esq. *Great Portland-street*
Test, Thomas, Esq. 7, *Leicester-place*
Thomas, David, Esq. *Pay Office, Horse Guards*
Thomson, the Rev. Robert, D. D. *Kensington*
Thomson, Alexander, Esq. *Somerset-street*
P Thompson, William, Esq. *Leeds, Yorkshire*
Thompson, William, Esq. *Thames-street*
Thompson, Mr. John, *Duke-street, York-buildings*
P Thornton, Samuel, Esq. M. P. *Clapham*
Thornton, Major General William, *Grosvenor-gate*
Thornton, Dr. Robert
Tildesley, Thomas, Esq. *Hampton-court*
Tilloch, Alexander, Esq. *Carey-street*
Thoyts, William, Esq. *Southamstead, Berks*
Timbrell, William Hall, Esq. *Charlotte-street, Portland-place*
P Timson, William, Esq. *Moon Park, Surrey*
Tomkison, Thomas, Esq. *Dean-street, Soho*
Tomlins, Mr. Thomas, *Lambeth-marsh*
Tooke, William, Esq. *Gray's-inn*
Topham, Edward, Esq.

Totton,

Totton, Stephens Dinely, Esq. A. M. *Abroad*
Towne, Mr. Francis
Townsend, Francis, Esq. Windsor Herald, *Heralds College*
††Towry, George Philips, Esq. Commissioner of the Victualling Office
P Travers, Mr. Joseph, *Swithin's-lane*
Trelawny, John, Esq. *Everet-street, Russel-square*
Trenchard, John, Esq. *Welbeck-street*
Tresham, Henry, Esq. *George-street, Hanover-square*
Trevelyan, Walter, Esq. *Morpeth, Northumberland*
Trotter, John, Esq. *Soho-square*
Trotter, Captain John, *Wimpole-street*
P Tunstall, Marmaduke, Esq. F. R. and A. S. *Wycliffe, Yorkshire*
P Turnbull, John, Esq. F. R. and A. S. *New Broad-street*
Turner, Charles H. Esq. *Limehouse*
Turner, Thomas, Esq. *Caughley-place, near Sheffnall, Shropshire*
P Turner, John Frewen, Esq. *Cold Overton, Leicestershire*
P Tyers, James, Esq. *Little Eastcheap*
Tytler, Henry William, M. D. *Titchfield-street*

U.

P Uxbridge, Henry Earl of, F. A. S.
Upham, James George, Esq. *White-horse-street, Ratcliffe-highway*
Upton, Charles, Esq. *Derby*

V.

P Valencia, Richard Lord Viscount, F. L. S.
Vernon, George Venables Lord, *Park-place*
P Villiers, Right Honourable J. C. M. P. *North-Audley-street*
Valangin, Francis, M. D. *Hermes-hill*
Valpy, the Reverend Richard, D. D. and F. A. S. *Reading, Berks*
Vandercomb, Joseph Fitzwilliam, Esq. *Bush-lane, Cannon-street*
Vaughan, Benjamin, Esq.
Vaughan, William, Esq. *Mincing-lane*
Venner, Corbyn Morris, Esq. *King's-bench-walk, Temple*
Vennor, Mr. Edward, Stationer, *Tower-hill*
††Vernon, John, Esq. *Bedford-square*
Vernon, Henry, Esq. *Hilton-park, Wolverhampton, or* 10, *Lower Wimpole-street*
Verrall, Richard, Esq. 10, *Harcourt-buildings, Temple*
Vidal, Emeric, Esq. *Brentford*
Vidler, Mr. John, *Milbank, Westminster*

Vidler,

Vigne, Stephen James, Esq. *Margaret-street, Westminster*
Vivian, John, Esq. *Gray's-inn*
Vivian, John, Esq. *Temple*

W.

P Warwick, George Earl of, F. R. and A. S.
P Winchelsea, George Earl of, F. A. S.
Westmeath, Right Honourable Earl of
* Williams, Sir Edward, Bart.
P Webb, Sir John, Bart. F. R. and A. S.
Wynn, Sir Watkin Williams, Bart. *St. James's square*
Willis, Sir Francis, Knt. *Charles-street, Berkley-square*
Wynne, the Right Hon. Sir William, LL. D. F. R. and A. S. *Doctors-commons*
Wadd, William, Esq. *Clifford-street*
††Wade, George, Esq. *Southampton-row, Bloomsbury*
Waistell, Mr. Charles, *High Holborn*
Wait, William, Esq. *Lawrence-Pountney-hill*
Wakefield, Mr. Edward, jun.
††Walcot, William, Esq. F. A. S. *Inner Temple*
P Wale, Gregory, Esq. *Shelford, near Cambridge*
Walker, John, Esq. F. R. and A. S. *Gower-street, Bedford-square*
Walker, John, Esq. *Argyll-street*
Walker, Thomas, Esq. *Woodstock, Oxon*
Walker, Mr. Daniel, *Great Pulteney-street*

Walker,

Walker, Mr. Thomas, *Epsom*
Walker, Thomas, Esq. *Russel-place, Fitzroy-square*
Walker, Thomas, Esq. *Croydon*
Walker, Joshua, Esq. *Rotherham*
Walker, Dean, Esq. *Conduit-street*
Waller, Charles, Esq. *West Wickham, Kent*
Waller, William, Esq.
Wallis, John, Esq. *Bodmin, Cornwall*
Walshman, Thomas, M. D. *Physician to the Surrey and Western Dispensaries*
Wansey, Mr. John, *Lothbury*
Wansey, Mr. George, *Warminster, Wilts*
Warburton, the Rev. W. P. *Lambeth-house*
P Ward, Mr. John, *Air-street, Piccadilly*
P Ward, Ralph, Esq. *Great Portland-street*
Ward, John, Esq. *Ludgate-street*
Warren, Peter, Esq. *Buckingham-street, Strand*
Watherstone, Dalhousie, Esq. *Duchess-street, Portland-place*
Watkins, George, Esq. *Featherstone-buildings*
Watkins, Jeremiah, Esq. *Charing-cross*
Watkins, Walter, Esq. *Groyney Works, near Abergavenny*
Watson, John, Esq. *Preston, Lancashire*
Watson, Lieutenant-General John, *Bryanstone-street*
P Watts, David Pike, Esq. 32, *Gower-street*
Watts, John, Esq. *Thames-street*
Weatherby, Edward, Esq. *Newmarket*
Webster, John, Esq. *Duke-street, Westminster*
P Wedgwood, John, Esq. F. L. S. *Charles-street, St. James's square*

Wedgwood,

Wedgwood, Josiah, Esq. *Etruria, Staffordshire*
Wedgwood, Thomas, Esq. *ditto*
Wenman, Charles, Esq. *Lambeth Walk*
P††West, Thomas Thompson, Esq. *Crown-court, Cheapside*
††West, Benjamin, Esq. President of the Royal Academy, and F. A. S. *Newman-street*
West, James, Esq. *Queen-Ann-street West*
Westcot, George, Esq. *Chelmsford*
Westmacott, Mr. Richard, *Mount-street, Grosvenor-square*
Weston, John Webbe, Esq. *Sutton-place, near Guildford*
Weymouth, Henry, Esq. *Battersea*
Whipham, Thomas, Esq. *Fleet-street*
White, Thomas, Esq. *Retford, Nottinghamshire*
††White, John, Esq. *Mary-le-bone*
White, John, jun. Esq. *ditto*
White, William Wood, Esq. *Walthamstow*
P White, Rev. Stephen, LL. D.
*††Whitefoord, Caleb, Esq. F. R. and A. S. V. P. *Adelphi*
Whitefoord, J. R. Esq. *Gloucester-place, Portman-square*
Whitfield, George, Esq. *Elm-court, Temple*
P Whitefield, Henry Fotherby, Esq. *Rickmansworth, Herts*
Whitehead, George, Esq. *Basinghall-street*
Whittingham, Mr. Charles, *Dean-street, Fetter-lane*

Whyte, John, Esq. *Brewer-street*

Whyte, Mr. William Peter, *Union-street, Bishopsgate-street*

Wiinholt, Claus Eduart, Esq. *of Copenhagen*

Wilberforce, William, Esq. M. P. *Palace-yard, Westminster*

Wilder, Lieutenant-Colonel Francis John

Wilkins, Jeffery, Esq. *Brecon*

††Wilkinson, John, Esq. *Brymbo, Denbighshire*

P Wilkinson, William, Esq. *Plasgrona, near Wrexham*

Wilkinson, Charles, Esq. *Soho-square*

Willet, John Willet, Esq. M. P. F. R. and A. S. *Grosvenor-square*

Williams, George Griffies, Esq. *Caermarthen*

Williams, Isaac Lloyd, Esq. *Southampton-street, Bloomsbury*

Williams, Mr. Nicholas

Williams, Mr. John, *Cornhill*

Williams, John Lloyd, Esq. *Somerset-street*

Williams, Joseph, Esq. *South-street, Finsbury-square*

Williamson, General Adam

Willich, Dr. A. F. M. *James-street, Covent-garden*

P††Willis, William, Esq. *Lombard-street*

P Willis, Robert, M. D. *Tenterden-street, Hanover-square*

††Willock, John, Esq. *Golden-square*

Wills, William, Esq. *Oxford-street*

Wilmot, John, Esq. *John-street, Bedford-row*

Wilson, Mr. Edward, *Strand*

Wilson,

Wilson, Thomas, Esq. *Navy Pay Office, Somerset-house*
Wilson, Rev. Mr. *Hall-place, Dartford, Kent*
Wilson, Thomas, Esq. F. L. S. *Gower-street*
Wilson, Matthew, Esq. *Red-lion-square*
Wilson, Joseph, Esq. *Milk-street*
Wilson, Mr. Thomas, *Fullwell Lodge, Twickenham*
Wilson, Mr. John, *Bedford-street, Covent-garden*
Wilson, Mr. Thomas, *St. John's College, Oxford, or Catherine-court, Trinity-square*
Wilson, Mr. Thomas, *Cheapside*
Wilsonne, Mr. William, *Basinghall-street*
Winder, Mr. John, *Shell Farm, Lenham, Kent*
Windus, William P. Esq. *Oxford-street*
Windus, Thomas, Esq. *Bishopsgate-street*
P Winne, Captain Isaac Lascelles
Winslow, Mr. Thomas, *Fullwell Lodge, Twickenham*
Winstanley, Mr. Charles, 38, *Newgate-street*
Winstanley, Henry, Esq. *Cheapside*
Winter, George, Esq. *Charlton, near Bristol*
Winter, James, Esq. *Inner Temple*
Winter, John, Esq. *St. James's street*
Wise, Matthew Blacket, Esq.
††Wisset, Robert, Esq. F. R. and A. S.
Wood, George, Esq. *New Broad-street-buildings*
Wood, John, Esq. *Cardiff*
Wood, William, Esq. *Cork-street*
Wood, John, Esq. *North-Cove, Yorkshire*
Wood, John, Esq. *St. Bartholemew's Hospital*
Woodburn, Mr. William, *St. Martin's lane*

Woodburn, Mr. John, *St. Martin's lane*
Woodfall, Mr. George, *Paternoster-row*
P Woodhull, Michael, Esq.
Woodthorp, Mr. William, *Fetter-lane*
Worrall, Jonathan, Esq. *Micklam, near Dorking, Surrey, or at* Mr. John Bond's, *St. Mary-axe*
Worthington, Thomas G. Esq. *Jefferies-square, St. Mary-axe*
P Wotton, William Samuel, Esq.
Wrather, Mr. Rowcroft, *Charing-cross*
††Wright, Nathaniel, Esq. *Hatton-street*
P††Wright, Peter, Esq. *Lamb's-conduit-street*
Wright, J. Esq. *Market Drayton, Shropshire*
Wright, Mr. Robert, *Theobald's-road*
Wright, Mr. Joseph, *Surrey-place, Surrey-street, Strand*
Wrighte, Rev. Thomas William, A. M. F. A. S. *Somerset-place*
Wyatt, Samuel, Esq. *Albion Mills*
Wyatt, John, Esq *Fleet-street*
Wyatt, James, Esq. R. R. *Queen-Ann-street East*
Wyatt, Jeffery, Esq. *Harley-street*
††Wynne, John, Esq. *Fig-tree-court, Temple*
††Wyndham, Thomas, Esq. M. P. *Dunraven, Glamorganshire*

Y.

††Young, Sir William, Bart. M. P. F. R. and A. S.
P Young, Arthur, Esq. F. R. S. &c. *Bradfield-hall, Suffolk*
Young, Samuel, Esq. F. R. and A. S. *Gower-street*
Young, Mr. Thomas, *Little Britain*

Z.

P Zenobio, Right Honourable Count Alvise

INDEX.

A.

Page

ACID, sulphuric, premium for the preparation of sulphur without nitric salt 39

ACORNS, set with the spade or dibble without digging or tillage, cannot be depended on to form good timber 94

AGRICULTURE, premiums in 7

papers in 77

AIR, external, of Britain, too cold for delicate fruits 162

edulcorates oil 226

ALLEN, Rev. William, certificate from, respecting Mr. Cherry's plantations 110

ANDERSON, Dr. the Gold Medal to 371

ANNATTO, premium for 65

APPLES, large, do not always ripen their fruit well 150

B.

BAR-iron, fine, premium for making 39

BEANS, premiums for the cultivation of 13

and WHEAT, premium for the cultivation of 13

and WHEAT, a paper on the culture of 123

BEANS, Method of ploughing the land when the crop of is in the ground 125
BEECH, James, Esq. the SILVER MEDAL to 191
BEETS, premiums for preserving 20
BHAUGULPORE, Cotton, premium for 65
BLIGHTS on Insects, premium for removing the ill effects of 11
BLOCK-TIN, premium for refining 40
BLUE-BELL, common, bulbs from, a paper on the preparation of, as a substitute for gum arabic 201
BORER, the insect, premium for destroying 62
BREAD-FRUIT trees, premiums for plantations of 61
a paper on the plantations of 357
BRICKS, Machine for making, premium for 56
BRITISH Settlements in the East Indies, premiums for 65
BROWNHILL, Mr. James, the Gold Medal to 271
BROWN, Mr. Robert, the Silver Medal to 123
BUCK-WHEAT, premium for the cultivation of 16
BUCKNALL, T. S. Dyot, Esq. thanks to 134, 144
BULL, Mr. Seth, Ten Guineas to 111

C.

CABBAGES, premium for preserving 19
CANDLES, Tallow, premium for manufacturing 34
premium for making from resin or other substances 74
CARRIAGES, two-wheeled, premium for preventing accidents from horses falling with 58
CARROTS, premium for preserving 20

CEMENT for engrafting trees 178
CHALK, the effect of, on the putrid substances of oil 221
CHEMISTRY, premiums in 32
papers in 201
CHERRY, Mr. the Gold Medal to 104
Gascoyne, or wild, will grow to twice the size of one engrafted 160
CHETWYND, Lord, plantations of Oaks by 92
CHINTS, patterns for calico-printers, premium for 45
CINNAMON from St. Vincent, observations on the 379
CLOTH, Cotton, premiums for a preparation, of a green colour, for printing 37
do. of a red stain for 80
from hop-stalks, premium for 50
CLOVE, a description of the 377
how propagated 374
the best mode of rearing from seeds 374
references to the coloured engravings of the 377
CLOVES, premiums for 60
and Cinnamon, communications respecting, from Dr. Anderson 371
CLULOW, Mr. Thomas, a bounty to, of twenty-five guineas 345
COALS, machine for raising, premium for 55
COCHINEAL, true, premiums for 65
COCHRANE, Mr. Spencer, thanks to 196
COCKCHAFER, premium for destroying the grub of 25
COLONIES, British, premiums for the advantage of the 60
and Trade, papers in 357

CONDITIONS, general 70
COPPER, premium for refining from the ore 41
plate patterns for calico-printers, premium for 45
CORN, in wet weather, premium for harvesting 21
Machine for reaping or mowing, premium for 25
CROPS, rotation of, premium for 17
CURWEN, Christian John, Esq. the Gold Medal to 96

D.

DENBIGH, Lord, plantations of Oaks by 92
DICKINSON, Mr. William, certificate from, respecting Mr. Brown's plantations 127
DOSSIE, Robert. See fish-oil
DRAWINGS, historical, premium for 45
ornamental, for architectural designs, premiums for 47
DRY-ROT in Timber, premium for preventing 32

E.

EARTHEN-WARE, premium for glazing without lead 40
ELMS, a paper on planting 115
when large, must not be transplanted into very exposed situations 121
ENGRAVING on wood, or metal blocks, premium for 47
EXTREME Branch grafting, a paper on 168
process for, how to be conducted 170

FAIRMAN,

F.

FAIRMAN, William, Esq. the Silver Medal to 168
FAMILY-MILL, premium for 55
FEATHERS, premium for clearing from their animal oil 33
FIRS, silver, a paper on the plantation of 101
FISH-OIL, a paper on the edulcoration of 209
the putrid smell of, is of two kinds 210
the reason of the presence of the gelatinous fluid in 211
presence of the bile in, to what owing 212
must be freed from the mixture of the heterogeneous matter 214
what substances may be applied to the removing putrescence in 215
processes for purifying 229, 230, 239, 232
FOREST-TREES, premiums offered for planting 7
FRUITS, valuable, ought to be sufficiently thinned in due time 139
engrafted, not permanent 145
FRUIT-TREES, engrafted, a paper on the varieties of 144
the size of not to be regarded in grafting 150

G.

GIBSON, Charles, Esq. the Silver Medal to 115
GRASS, seeds, premium for raising 16
GRAY, Lawrence, certificate from, respecting Mr. Vernon's plantations 103

GREATHEAD, Mr. Henry, the Gold Medal to, and Fifty Guineas for his Life-Boat 283
GUERNSEY Cows milk, said to contain more butter and cheese than other cows milk 183
GUN-LOCK, a paper on the improvement of a 243
description of a 245
GUNPOWDER-MILLS, premium for 54

H.

HAGLO-CRAB, where discovered 153
HEATING-ROOMS, for the purposes of manufactures, premiums for 57
HEMP, premium for the cultivation of in Scotland 30
ditto in Canada 62
importation of Canada, premium for 64
HONORARY Premiums for drawing 43
HOPS, premium for destroying the fly in 26
HUNTER, John, Esq. the Gold Medal to 77
HYACINTHUS NON SCRIPTUS. See Blue-bell common

I.

INSECTS, premium for preventing the blight of 10
JOHNES, Thomas, Esq. the Gold Medal to 182
IRON, premium for preserving from rust 40
IRRIGATION of Land, premium for raising water for the 29

K.

K.

KALI, for Barilla, premium for 61
KERNELS, what sort of to be chosen for sowing 150
KNIGHT, Mr. Richard, the Silver Medal to 247

L.

LABILLARDIERE, Monsieur, extract from the Voyage of 367
LAND, arable, premium for ascertaining the component parts of 22
lying waste, premium for improving 22
premium for gaining from the sea 24
LANDAFF, the Bishop of, certificate from, respecting Mr. Gibson's plantations 116
LANDSCAPES, premium for drawing of 44
LARCH-TREES, a paper on the plantation of 96
LEAD, the effect of, on putrid oils 224
LIFE-BOAT, by Mr. Greathead, a description of the 283
how to be used 295
certificate respecting 300
particulars relative to the construction of, and benefits received from 302
Description of the engravings of the 320
Management of the, from the boat-house to the sea, and *vice versâ* 324
Instructions for the management of the 326
LIME, the effects of, when commixed with oil 220
and Chalk, the cheapest ingredients for the edulcoration of train-oils 227

LINE Engravings of Landscapes, premium for 46
of Historical subjects 46
LLOYD, Mr. a paper from, on Mr. Knight's method of breaking up logs 254
LOGS of Wood, a paper on the method of breaking up 247
Description of the method of breaking up 251
LOOM, improved by Mr. Clulow 345

M.

MAGNESIA ALBA, the effect of, on fetid oils 221
MANUFACTURES, premiums in 50
MANURES, premiums in 23
MAP, Mineralogical, of England and Wales, premium for 41
of Ireland 41
of Scotland 42
MEADOW-HAY in wet weather, premium for making 21
MECHANICS, premiums in 54
papers in 243
MILL-STONES, premium for 58
a paper on 271
Certificates respecting 275
MINERALS, British, premium for the analysis of 38
MODEL in clay or plaster, premium for 46
MODELS and Machines, catalogue of 400

N.

NATURAL HISTORY, premium for 42
NITRATE, premium for the preparation of any alkaline or earthy 39

NORTHUMBERLAND Life-Boat, account of the 307
the Duke of, a letter from, on Mr. Greathead's Life-Boat 315
NUTMEGS, premium for 60

O.

OAK, principal obstruction to the cultivation of 82
Observations on the growth of the 84
Timber, a paper on the cultivation and growth of 80
OAKS, premiums for raising 8
A paper on the plantation of 77
of twice the present magnitude, may be obtained in fifty years 83
Practical directions respecting the management of a plantation of 85
OCHROUS earth of iron, the effect of, on the putrid parts of oil 225
OFFICERS, List of 403
OIL, Whale or Seal, premium for refining 33
Fish. See Fish-Oil
OILS, essential and ethereal, not applicable to the edulcoration of fetid oils 225
ORE, machine for raising, premium for 55
ORTON, Mr. letter from, respecting Mr. Greathead's Life-Boat 318
OSIERS, a paper on planting 104
OUTLINES, premiums for drawings of 44

P.

PAINT, premium for a substitute for the basis of 37
PAPER from raw vegetable substances, premium for 51
transparent, premium for 52
PARSNIPS, premium for the cultivation of 15
premium for preserving 20
PERRIE, Adolphus, certificate from, respecting Mr. Gibson's plantations 116
PIGMENT, red, premium for preparing 38
PIPPIN, Golden, is native English 153
PLANTING and Draining, a paper on 191
POLITE ARTS, premiums in 43
Conditions for the 67
POOR, labouring, premium for improving the condition of 28
PORPOISES, premium for taking 52
Oil from, premium for 52
POTATOES, premium for preserving 20
Observations on feeding with, instead of hay 98
PRESENTS received by the Society 392
PROVISIONS, salted, premium for preserving 32

R.

RED-STREAK, the, a seedling of Herefordshire 153
REWARDS bestowed by the Society 383
ROBLEY, Joseph Esq. the Gold Medal to 357
ROCKS, premium for boring and blasting 57
ROADS, turnpike, premium for clearing from mud and dust 59

S.

Sacks, description of the method of weaving, in Mr. Clulow's Loom 353
Scarborough Life-Boat, account of the 310
Salts, neutral, have little effect in edulcorating oils 223
Scion of a new Apple, observation respecting 161
Salt-sea, the effects of, on the putrid fœtor of oils 222
Salts, Alkaline, the fixed, only to be used for the edulcoration of oils 216
Sheep, premium for the cure of the rot in 26
Premium for preventing the ill effects of flies on 27
Premium for protecting 27
Silk, machine for carding, premium for 50
Speechley, Mr. observation of, respecting Vines 141
Spirit-proof, premium for making 35
Spring Wheat, a paper on the cultivation of 195
Stainforth, Mr. certificate by, to Mr. Hunter's plantations 79
Statuary Marble, premium for the discovery of 48
Steam, premium for increasing 35
Stire Apple, where first raised 153
Sugar, premium for separating, from treacle 34

T.

Tan, premium for the preparation of 36
Tar, premium for substitute for 35
Thrashing Machine, premium for 25
Tillage, comparative, premium for 11

TIMBER-TREES, premium for securing plantation of 8
A paper on sowing, planting, and inclosing 182
TIMBERS, a paper on the method of securing from danger 258
Description of the method of securing 260
TIMBRELL, W. H. Esq. the Gold Medal to 331
TRANSIT, instrument for 54
TREES, different, of the same variety, have a wonderful tendency to similarity of appearance 152
planted by Thos. Johnes, Esq. an account of 185
TRINITY-HOUSE, certificate from the, respecting Mr. Greathead's Life-Boat 316
TRUSS, Herniary, an account of an improved 331
TURNIPS, premium for the comparative culture of 14
for preserving 18

V.

VARIETIES, different, of fruits, how distinguished 158
VEGETABLES, premium for preserving the seeds of 32
VENTILATION, improved, premium for 57
VERNON, Henry, Esq. the Gold Medal to 101
VINE, Hampton Court, communication relative to the 134
not subject to blight 137
probably a new variety 141

U.

ULTRAMARINE, premium for preparing 38

W.

WATER, machine for raising, premium for 56
has an edulcorative action on fetid oils 226
WEBB, Mr. John, Twenty Guineas to 243
WHALES, premium for taking, by the gun harpoon 55
WHEAT, premium for the comparative culture of 12
Spring, premium for 12
Machine for dibbling, premium for 24
WICKS for Candles or Lamps, premium for 51
WILLIS, Mr. Thomas, the Silver Medal to 201
WOART, Mr. James, Ten Guineas to 258
WORMS, premium for destroying 26

Y.

YATES, the Rev. Richard, the Silver Medal to 80

DIRECTIONS TO THE BOOKBINDER.

Place the Print of his Grace the late Duke of Bedford, as Frontispiece to the Volume, to face the Title-page.

The Plate No. I. of Mr. Fairman's Method of Extreme-Branch Grafting, to face page 180.

The Plate No. II. of Mr. Webb's Gun-Lock, to face page 244.

The Plate No. III. of Mr. Knight's Apparatus for blasting Wood, and Mr. Woart's Method of supporting Timber, to face page 258.

The Plate No. IV. of Mr. Woart's additional Method of supporting decayed Timbers, to face page 270.

The Plate No. V. a perspective View of Mr. Greathead's Life-Boat, to face page 320.

The Plate No. VI. of the Sections of Mr. Greathead's Life-Boat, to face page 330.

The Plate No. VII. of Mr. Clulow's Loom, to face page 354.

The Plate No. VIII. of the Golden-Grove Estate in Tobago, to face page 370.

The Plate No. IX. of the Clove Plant, to face page 380.

1997
30-11-nt
.5